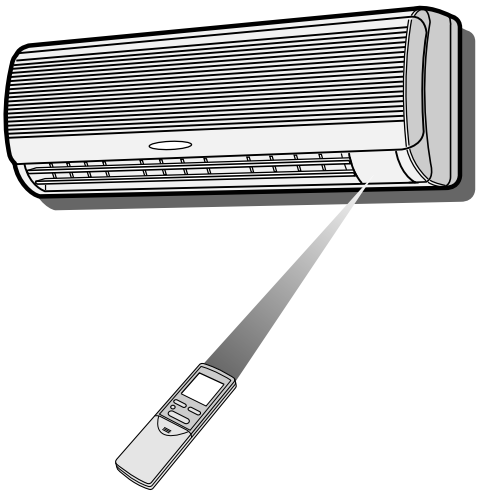
SHARP **SERVICE MANUAL**

S2915AYA099E/



SPLIT SYSTEM ROOM AIR CONDITIONERS

INDOOR UNIT

MODELS AY-A079E
AY-A099E

OUTDOOR UNIT

AE-A079E
AE-A099E

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

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SHARP CORPORATION

SPECIFICATIONS

ITEMS		INDOOR UNIT	OUTDOOR UNIT	INDOOR UNIT	OUTDOOR UNIT
		AY-A079E	AE-A079E	AY-A099E	AE-A099E
Cooling capacity	kW	2.1		2.6	
Heatpump Heating capacity	kW	2.4		3.0	
Moisture removal	Liters/h	0.9		1.2	

★ **Electrical data**

Phase		–	Single			
Rated frequency		Hz	50			
Rated voltage range		V	198 to 264			
Rated voltage		V	220 - 240			
Rated current	Cool	A	3.2 - 3.1		4.1 - 3.9	
	Heat	A	2.9 - 2.8		4.0 - 3.9	
Rated input	Cool	W	680 - 720		890 - 920	
	Heat	W	630 - 670		880 - 920	
Power factor	Cool	%	97 - 97		99 - 98	
	Heat	%	99 - 99		99 - 98	
Compressor	Type		Hermetically sealed rotary type			
	Model		2PS134D5AA01		RH174VHET	
	Oil charge		270cc (SUNISO 4GDID)		300cc (DIAMOND MS56)	
Refrigerant system	Evaporator		Louver fin and Grooved tube type(7mm tube)			
	Condenser		Corrugate Fin and Grooved tube type			
	Control		Capillary tube			
	Refrigerant volume		690g		730g	
	De-Ice system		Micro computer controled reverse sysetm			
Noise level (at cooling)	High	dB(A)	33	43	38	43
	Med.	dB(A)	29	–	31	–
	Low	dB(A)	26	–	27	–

Fan system

Drive			Direct drive			
Air flow quantity (at cooling)	High	m^3/min.	5.8	20	7.1	20
	Med.	m^3/min.	4.9	–	5.3	–
	Low	m^3/min.	4.3	–	4.4	–
Fan			Cross flow fan	Propeller fan	Cross flow fan	Propeller fan

Connections

Refrigerant coupling	Flare type
Refrigerant tube size Gas, Liquid	3/8", 1/4"
Refrigerant pipe sets No.	AZ-24H5E; 5m(16.4ft), AZ-24H7E; 7m(23ft)
Drain piping mm(Inches)	O.D ø 18(45/64)

Others

Safety device			Compressor: Overload protector(MRA98589)		Compressor: Overload protector(Internal)	
			Fan motors: Thermal fuse			
			Fuse, Micro computer control			
Air filters			Polypropylene net (Washable)			
Net dimensions	Width	mm	790	720	790	720
	Height	mm	270	535	270	535
	Depth	mm	155	236	155	236
Net weight		kg	7	27	7	31

Note: The condition of star (★) marked item are 'IEC 378'.

EXTERNAL DIMENSIONS

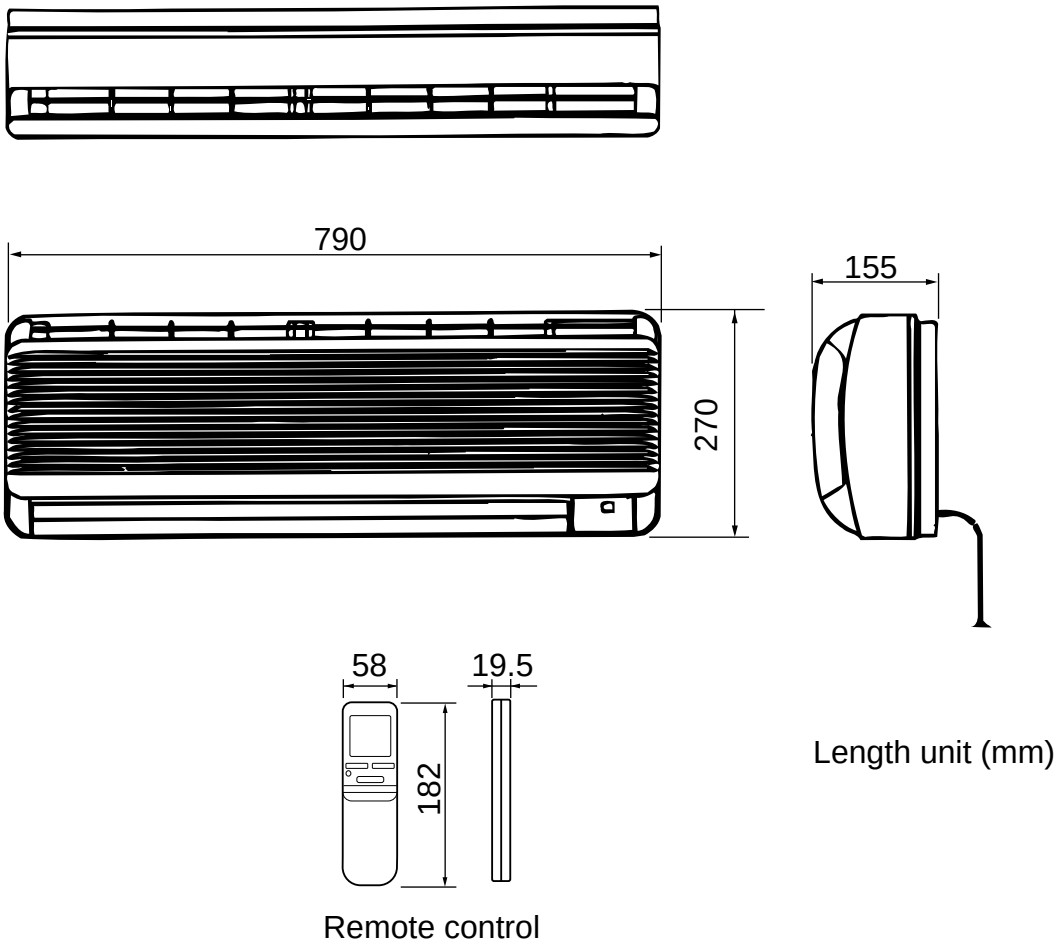


Figure E-1. INDOOR UNIT for AY-A079E and AY-A099E

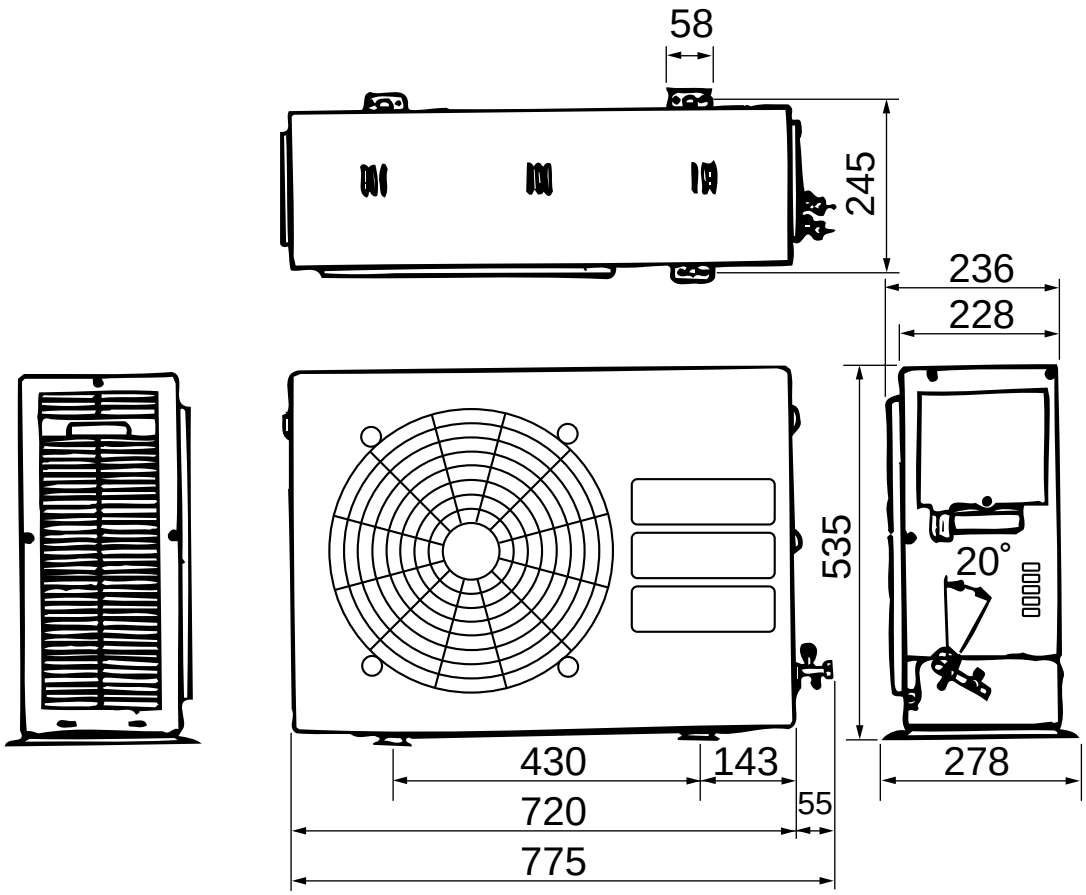


Figure E-2. OUTDOOR UNIT for AE-A079E and AE-E099E

WIRING DIAGRAMS

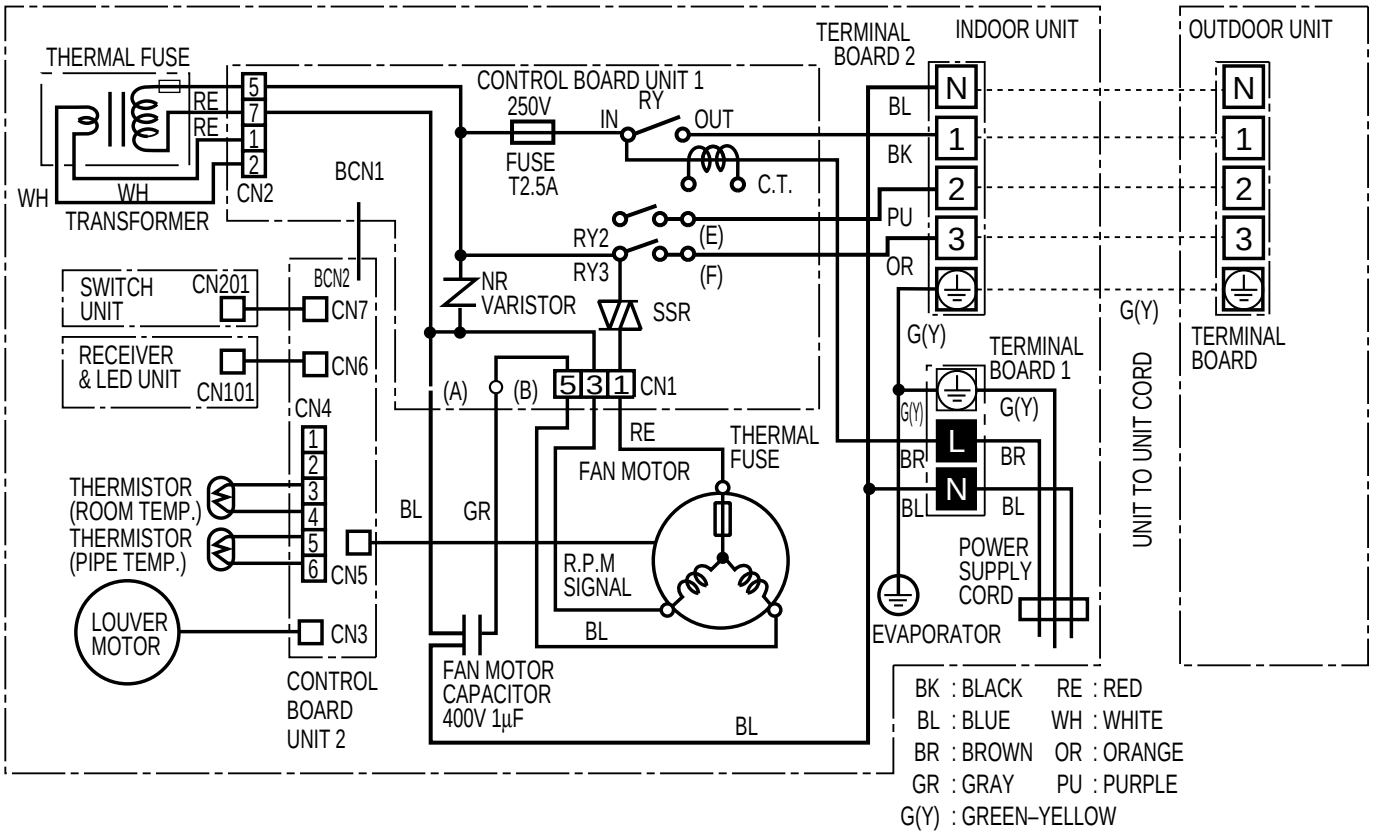


Figure W-1. Wiring Diagram for AY-A079E and AY-A099E

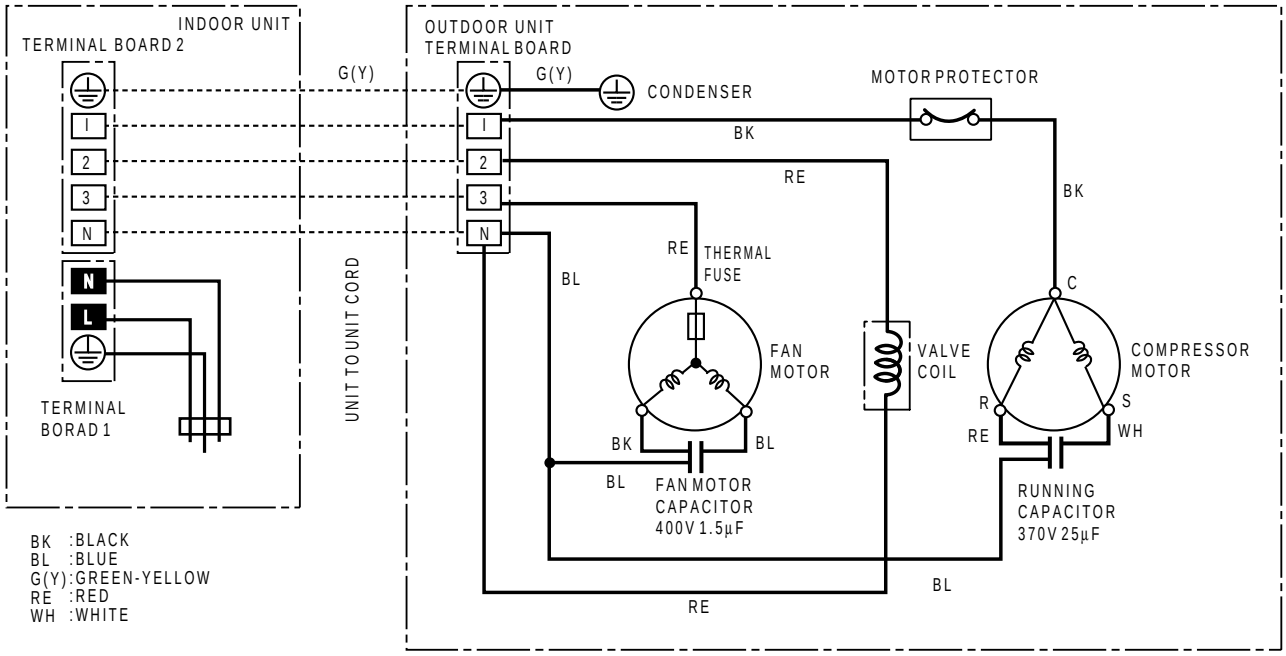


Figure W-2. Wiring Diagram for AE-A079E

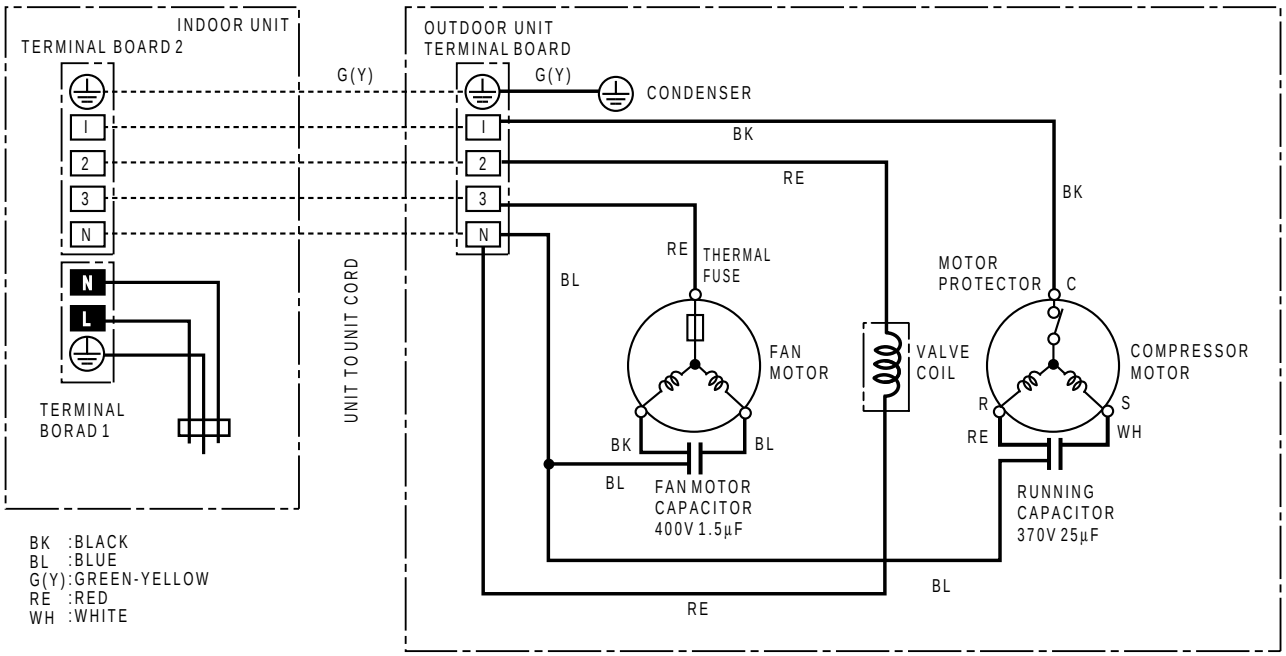


Figure W-3. Wiring Diagram for AE-A099E

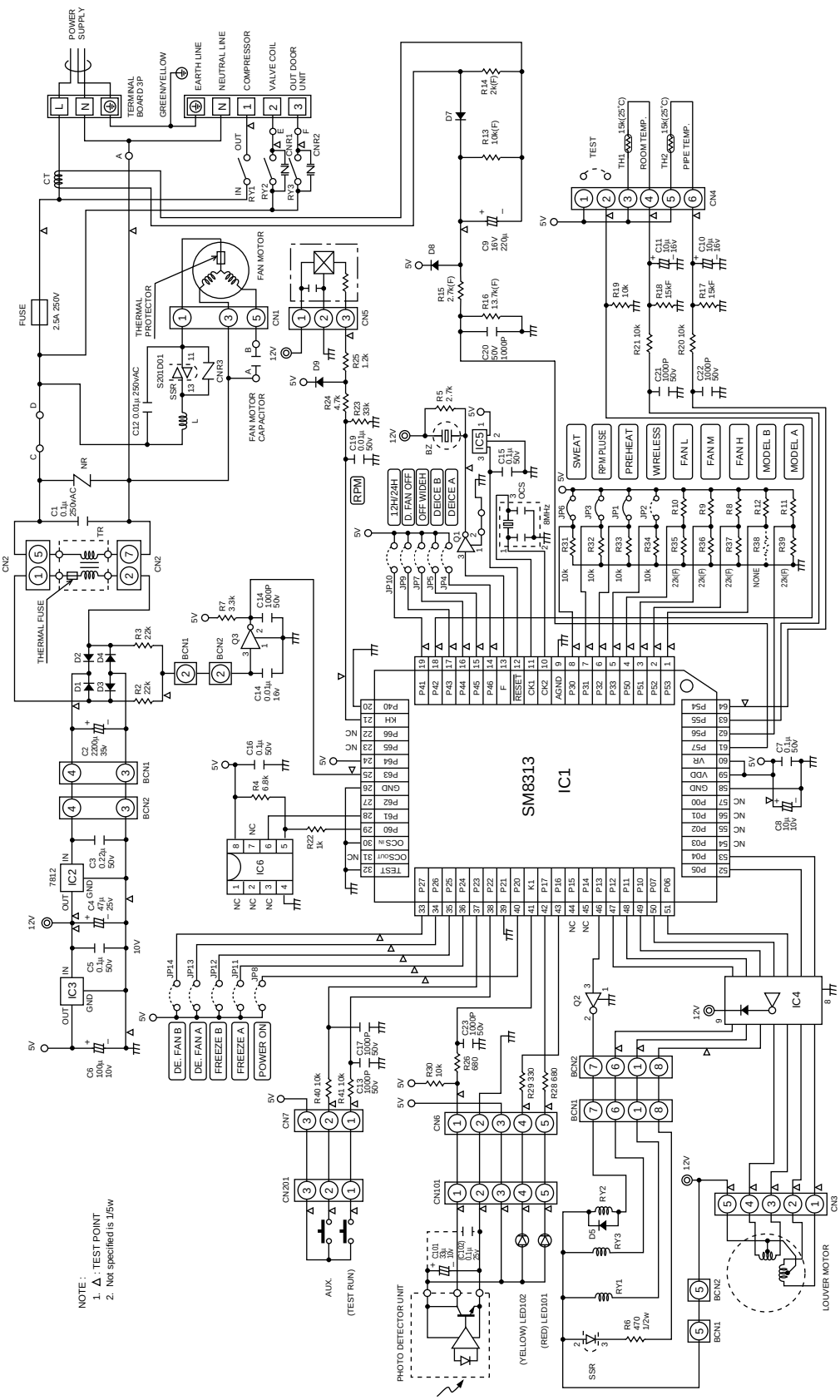
ELECTRICAL PARTS

For Model AY-A079E and AE-A079E

DESCRIPTION	MODEL	REMARKS	SITE
Compressor	2PS134D5AA01	220/240V, 50Hz, 650W	AE
Indoor fan motor	ML-A411	220/240V, 50Hz	AY
Outdoor fan motor	ML-A592	220/240V, 50Hz	AE
Indoor fan motor capacitor	–	400V, 1µF	AY
Outdoor fan motor capacitor	–	400V, 1.5µF	AE
Running capacitor	–	370V, 25µF	AE
Transformer	–	Primary; AC 220V,50Hz Secondary; AC16.1V, 50Hz	AY
Fuse		250V, 2.5A	AY
Reverse valve	MMB-26A	240V	AE
Reverse valve coil	RSV-10	–	AE

For Model AY-A099E and AE-A099E

DESCRIPTION	MODEL	REMARKS	SITE
Compressor	RH174VHET	220/240V, 50Hz, 800W	AE
Indoor fan motor	ML-A411	220/240V, 50Hz	AY
Outdoor fan motor	ML-A592	220/240V, 50Hz	AE
Indoor fan motor capacitor	–	400V, 1µF	AY
Outdoor fan motor capacitor	–	400V, 1.5µF	AE
Running capacitor	–	370V, 25µF	AE
Transformer	–	Primary; AC 220V, 50Hz Secondary; AC16.1V, 50Hz	AY
Fuse	–	250V, 2.5A	AY
Reverse valve	MMB-26A	240V	AE
Reverse valve coil	RSV-10	–	AE



NOTE :
1. Δ : TEST POINT
2. Not specified is 1/5w

FUNCTION	12H / 24H	D. FAN OFF	OFF WIDEH	DEICE B	DEICE A	SWEAT ON/OFF	RPM PLUSE 1/3	PREHEAT OFF/ON	WIRELESS CHANG/ NORMAL	FAN L	FAN M	FAN H	MODEL B	MODEL A	DE. FAN B	DE. FAN A	FREEZE B	FREEZE A	POWER ON
IC1 PIN NO.	19 (P41)	17 (P43)	16 (P44)	15 (P45)	14 (P46)	8 (P30)	7 (P31)	6 (P32)	5 (P33)	4 (P50)	3 (P51)	2 (P52)	1 (P53)	64 (P54)	33 (P27)	34 (P26)	35 (P25)	36 (P24)	40 (P20)
SYMBOL	JP10	JP9	JP7	JP5	JP4	JP6	JP3	JP1	JP2	R10	R9	R8	R12	R11	JP14	JP13	JP12	JP11	JP8
AY-A079E	X NONE	X NONE	X NONE	X NONE	X NONE	○ USE	○ USE	○ USE	X NONE	X NONE	140k(F)	24.9K(F)	22k(F)	133k(F)	X NONE	X NONE	X NONE	X NONE	X NONE
AY-A099E	X NONE	X NONE	X NONE	○ USE	○ USE	○ USE	○ USE	○ USE	X NONE	140k(F)	15k(F)	15k(F)	1.87k(F)	107k(F)	X NONE	X NONE	X NONE	X NONE	X NONE

Figure L-1. Electronic Control Circuit Diagram for AY-A079E and AY-A099E

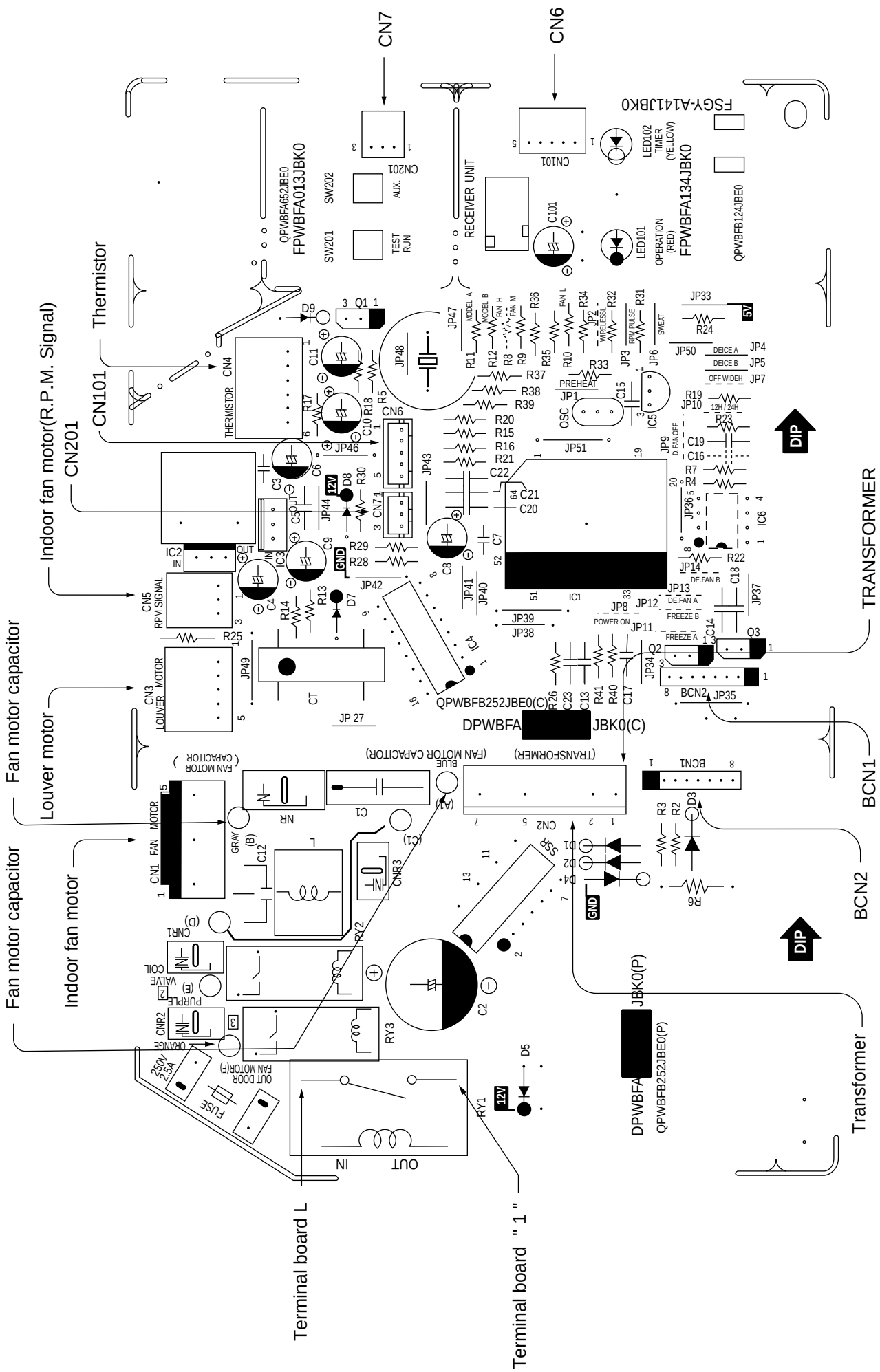


Figure L-2. Printed Wiring Board

Microcomputer (IC1)

The microcomputer is a CMOS, one chip, 8-bit microcomputer.
Microcomputer port allocation is as follows.

Pin No.	Terminal Name	Input Output	Function
1	P53	IN	MODEL B
2	P52	IN	FAN H
3	P51	IN	FAN M
4	P50	IN	FAN L
5	P33	IN	WIRELESS
6	P32	IN	PREHEAT
7	P31	IN	PRM PLUSE
8	P30	IN	SWEAT
9	AGND	IN	0V
10	CK2	IN	OSILLATION
11	CK1	IN	OSILLATION
12	RESET	IN	RESET
13	F	OUT	BUZZER
14	R46	IN	DEICE A
15	R45	IN	DEICE B
16	R44	IN	COMP. OFF WIDTH
17	R43	IN	DEHUM. FAN OFF
18	R42	IN	TEST 1
19	R41	IN	–
20	R40	IN	–
21	KH	IN	PRM SIGNAL
22	P66	IN	–
23	P65	IN	–
24	P64	IN	–
25	P63	IN	AC CLOCK
26	GND	IN	0V
27	P62	IN	–
28	P61	OUT	EEPROM CLOCK
29	P60	IN	EEPROM DATA
30	OSC	IN	–
31	OSC	OUT	–
32	TEST	IN	–

Pin No.	Terminal Name	Input Output	Function
33	P27	IN	MODEL 4
34	P26	IN	MODEL 3
35	P25	IN	MODEL 2
36	P24	IN	MODEL 1
37	P23	IN	SWITCH AUX.
38	P22	IN	SWITCH TEST RUN
39	P21	IN	–
40	P20	IN	POWER ON
41	KI	IN	WIRELESS SIGNAL
42	P17	OUT	LED OPERATION
43	P16	OUT	LED TIMER
44	P15	OUT	–
45	P14	OUT	–
46	P13	OUT	(VALVE COIL)
47	P12	OUT	(OUT DOOR FAN)
48	P11	OUT	RY1
49	P10	OUT	SSR
50	P07	OUT	LOUVER MOTOR
51	P06	OUT	LOUVER MOTOR
52	P05	OUT	LOUVER MOTOR
53	P04	OUT	LOUVER MOTOR
54	P03	OUT	–
55	P02	OUT	–
56	P01	OUT	–
57	P00	OUT	–
58	GND	IN	0V
59	VDD	IN	5V
60	VR	IN	5V
61	P57	IN	(CURRENT LEVEL)
62	P56	IN	TH1
63	P55	IN	TH2
64	P54	IN	MODEL A

FUNCTIONS

1. Temperature control characteristic

1-1 COOL operation

In the “COOL” mode, the thermostat circuit is controlled by four thermostat lines (C1 thru C4).

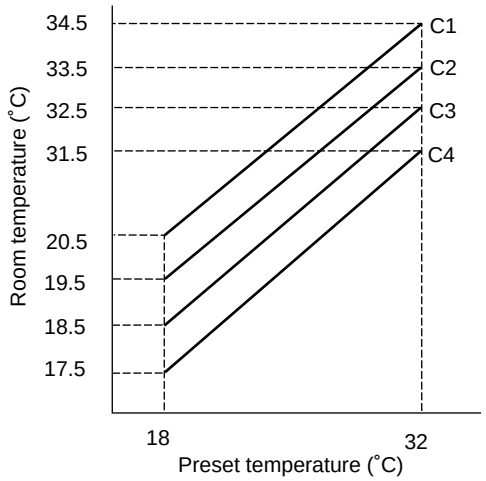


Figure Y-1

1-2 DRY operation

In the “DRY” mode, the thermostat circuit is controlled by three thermostat lines (D1 thru D3).

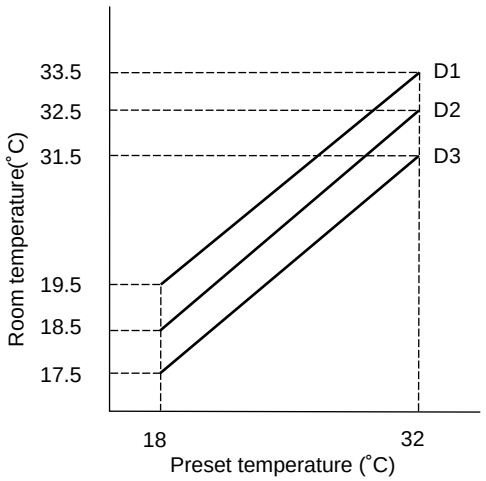


Figure Y-2

1-3 HEAT operation

In the “HEAT” mode, the thermostat circuit is controlled by six thermostat lines (H01 thru H4).

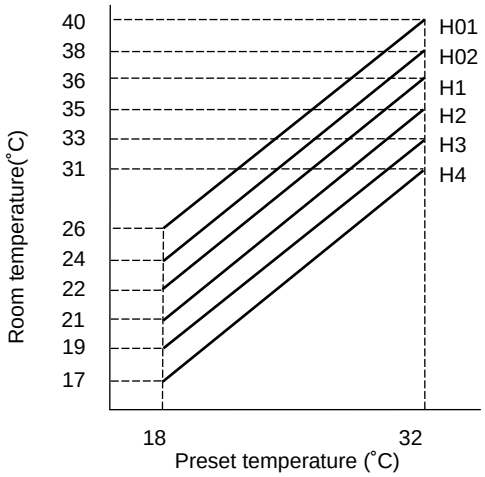


Figure Y-3

2. Operation modes

2-1 COOL operation

The compressor turns on or off, at the thermostat lines C3 and C4. The outdoor fan motor is also controlled with the compressor.

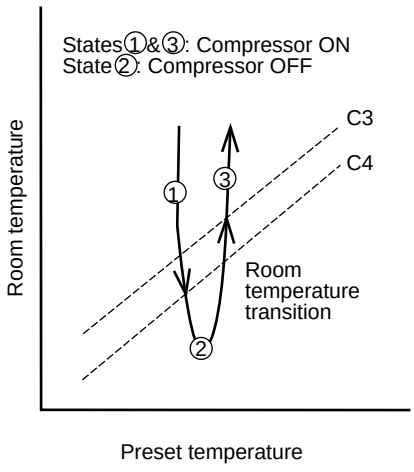


Figure Y-4

2-2 DRY operation

On the switch on, the compressor always starts to operate for 2 minutes with fan speed “D” (slower than “UL”).

The microcomputer reads the room temperature 2 minutes after this first compressor operation. This room temperature is set as the preset temperature automatically.

The preset temperature ranges from 18˚C to 32˚C. When the room temperature is below 18˚C, the preset temperature is set to 18˚C, and when the room temperature is over 32˚C, the preset temperature is set to 32˚C.

Dry operation is divided into three zones (Cooling zone, Dehumidifying zone and Circulating zone) by thermostat lines (D1 to D3), and the compressor and the fan motor are controlled in each zone as shown in Table Y-1.

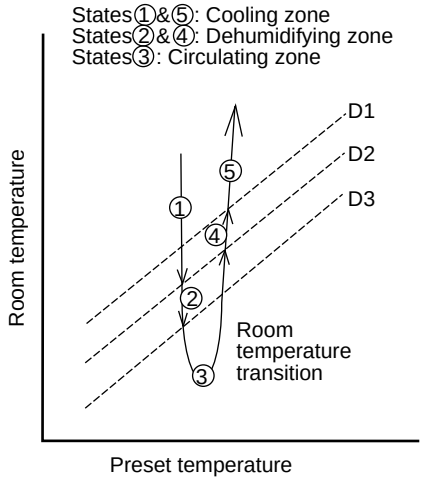


Figure Y-5

Table Y-1

	Compressor	Fan Speed
Cooling zone	ON	“UL”
Dehumidifying zone	ON	“D”
Circulating zone	OFF	“D” or OFF

2-3 Heat operation

The compressor turns on or off, at State 2 , turns on continuously at State 1 & 3 .

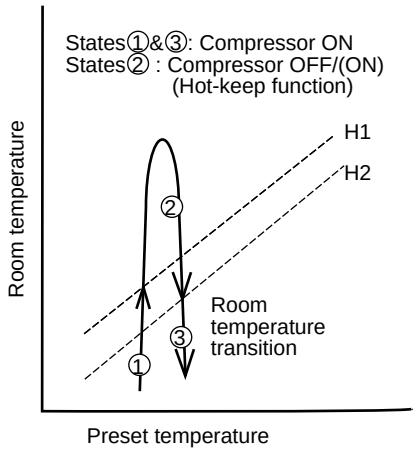


Figure Y-6

2-4 Fan only operation

The indoor fan motor always turns on.

3. Fan speed

Fan speeds are given by the indoor fan motor, "H", “M”, “L”, “UL” and "D" which are available in the following operation mode.

Table Y-2

FAN Switch	HEAT	COOL	FAN ONLY
HIGH	H	M	M
LOW	M	L	L
SOFT	L	UL	UL

4. Hot-Keep

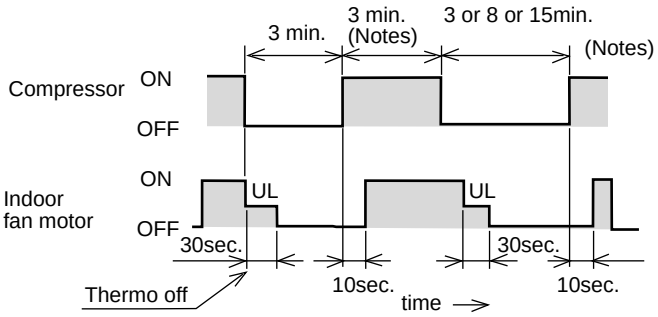
This function automatically controls the on-off operation of the indoor fan motor in accordance with the on-off operation of the compressor during the heating operation, thereby preventing the air conditioner from delivering a cold air when the compressor is off.

When the room temperature exceeds the thermostat line “H1”, the compressor is turned off, and the indoor fan motor is turned off after rotating at “UL” for 30 seconds.

3 minutes after turning off the compressor, the compressor is turned on for 3 minutes. (below thermostat line H01). While over H01, the compressor is off.

At 10 seconds after turning on the compressor, the indoor fan motor is turned on.

The next compressor OFF time is for 3, 8 or more than 8 minutes according to the room temperature (the time increases with a rise of room temperature) when 3 minutes elapse after turning on the compessor.



Notes: Compressor is off when compressor OFF time is 15 minutes.

Figure Y-7

5. Preheat air flow

This function is intended to prevent cold air from being discharged when the heating operation starts or when defrosting.

When the indoor pipe temperature is below 29˚C at the begining of the heat operation or after defrosting, the indoor fan motor stays.

When the indoor pipe temperature gets higher than 29˚C, the fan motor is turned on at speed “UL” after compensation of starting.

When the indoor pipe temperature exceeds 35˚C, the specified fan speed is restored. When the indoor pipe temperature falls below 30˚C, the fan speed shifts down to “UL”. And, when the indoor pipe temperature falls below 24˚C, the fan motor turns off. Then, over 29˚C , it turns on again at speed “UL”.

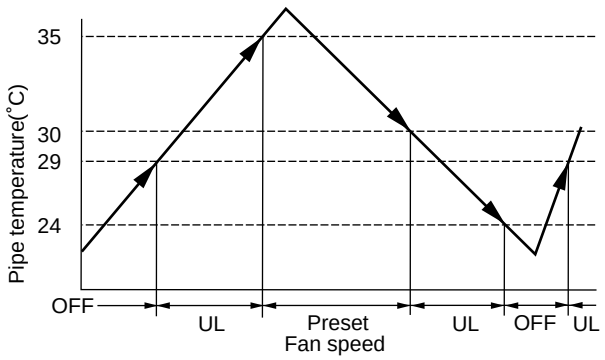


Figure Y-8

6. Overheating protection system

When overloading occurs during the heating operation, this system controls the outdoor fan motor according to the indoor pipe temperature to prevent the overloading of the compressor and restrain the rise in high pressure.

When the indoor pipe temperature exceeds U1˚C, the outdoor fan motor is turned off, and when the indoor pipe temperature falls U2˚C, the outdoor fan motor turns on.

If 3 minutes elapse after turning off outdoor fan motor, the outdoor fan motor is turned on, when the indoor pipe falls U1˚C,

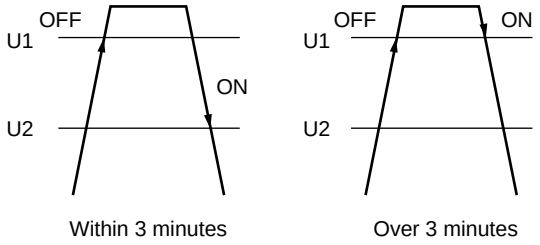


Figure Y-9

Table Y-3

MODELS	Fan Speed / Line	M	L	UL
AY-A079E	U1	53˚C	53˚C	53˚C
	U2	49˚C	49˚C	49˚C
AY-A099E	U1	53˚C	54˚C	54˚C
	U2	49˚C	50˚C	50˚C

7. Current control

This system, in order to prevent overcurrent during heating operation, controls the outdoor fan motor and changes the indoor fan motor speed by detecting total current.

When the current exceeds P2, the outdoor fan motor is automatically turned off, and when the current falls below P4, the outdoor fan motor is turned on.

When the current exceeds P3 and the indoor fan speed shifts down because of cold air (5. Preheat air flow), the changes in the indoor fan speed shifts up as follows, from "off" to "UL", or from "UL" to "L". And when the current falls bellow P5, the indoor fan speed shift up is canceled.

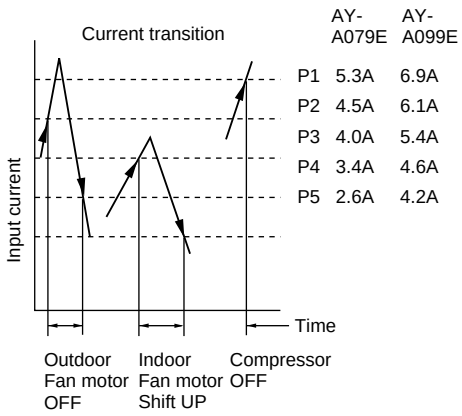


Figure Y-10

8. Freeze preventive

When the indoor pipe temperature falls below -1˚C during cool operation or dry operation, the compressor is turned off.

9. Defrost

The defrost timer (integrating the operation time of compressor) counts time with microcomputer during heat operation.

Frost of outdoor pipe is estimated by indoor pipe temperature (TH2), room temperature (TH1), indoor fan speed and operation state of compressor.

In the defrost operation, first the compressor is turned off, the fan speed is set to “UL” and the outdoor fan motor is turned off.

30 seconds later the indoor fan motor is turned off, 50 seconds later the reverse valve is turned off, and 60 seconds later the compressor is turned on.

In the end of defrosting, the compressor is turned off, the outdoor fan motor is turned on, 50 seconds later the reverse valve is turned on, 60 seconds later the compressor is turned on, starting heat operation.

At this time, the indoor fan motor is turned off or the fan speed is set to “UL” if preheat air flow function is effective.

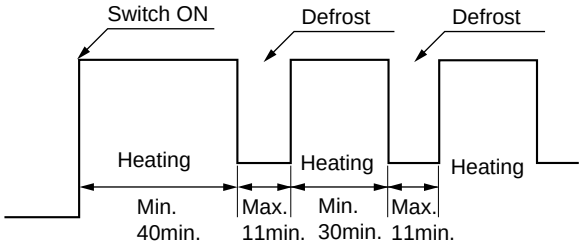


Figure Y-11

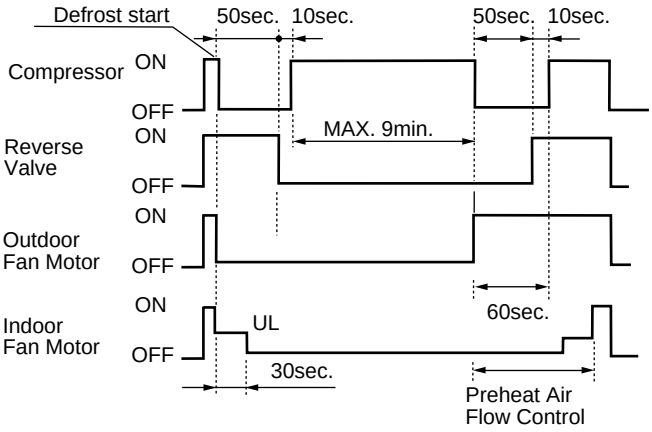


Figure Y-12

10. Delayed operation of the reverse valve

When the heat operation is shut down or the operating mode is switched from heat to cool or dry, or vice versa, the reverse valve is switched after 3 minutes.

11. Test run

If the “TEST RUN” button in the unit is pushed during suspension of operation, cool test operation starts. At this time, the fan speed is set to “AUTO”.

If this button is pushed during operation, the test operation starts in current operation mode. The operation LED (red) flickers during test run.

In cool and heat mode continuous compressor on operation is performed. In dry mode the operation is in dehumidifying zone. In fan only mode the indoor fan motor runs continusly.

12. Timer

12-1 24-HOUR PROGRAMMABLE ON/OFF TIMER

ON-TIMER or OFF-TIMER can be independently programmed. When the unit operates during one hour after the OFF-time is set, thermostat setting is automatically shifted (+1˚C in cool operation and dry operation, -3˚C in heat operation, 16˚C - 32˚C).

When the ON-timer is set in heat operation and cool operation, operation starts before 0 to 30 minutes(depends on the room temperature) so that preset temperature is obtaind at set time.

12-2 ONE-HOUR TIMER

When ONE-HOUR timer is set, the unit turns off automatically after one hour. The one hour timer operation has priority over other time operation, such as the TIMER ON and TIMER OFF. If the ONE-HOUR TIMER button is pressed again during operation, the unit will operate additionally for another one hour.

13. Automatic air conditioning

When automatic air conditioning is selected, the operation mode and preset temperature are set automatically according to the room temperature on starting operation.

Table Y-4

Room temperature at operation start	Operation Mode	Preset Temperature
Above 28˚C	COOL	26˚C
26˚C ~ 28˚C		25˚C
24˚C ~ 26˚C		24˚C
21˚C ~ 24˚C	DRY	Room temperature at operation start
Below 21˚C	HEAT	23˚C

14. Automatic fan speed

When the automatic fan speed is selected in cool or heat operation, the fan speed is automatically changed by the thermostat lines C1 to C3 in cool operation, and H1 to H4 in heat operation.

a.COOL operation

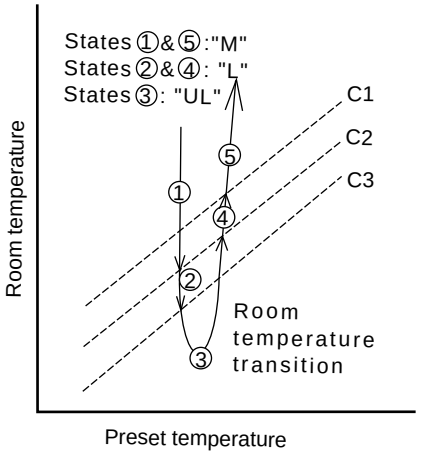


Figure Y-13

b. HEAT operation

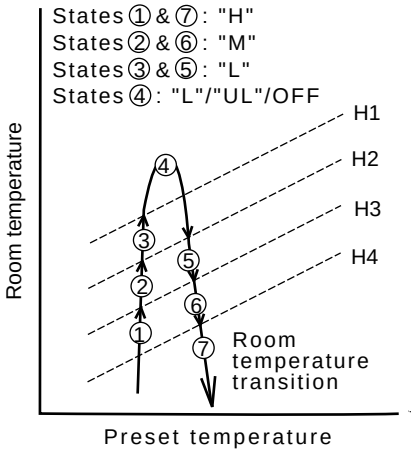


Figure Y-14

15. Outputs in each operation mode

Table Y-5

Mode		Compressor	Outdoor Fan Motor	Indoor Fan Motor	Valve Coil
COOL	Cooling	ON	ON	ON	OFF
	Circulating	OFF	OFF	ON	OFF
HEAT	Normal	ON	ON	ON	ON
		OFF	OFF	ON/UL/OFF	ON
	Preheat Air Flow Control	ON	ON	UL/OFF	ON
	ON Defrost	ON	OFF	OFF	OFF
DRY	Cooling			L/UL	OFF
	Dehumidiflying	ON	ON	UL/D	OFF
	Circulating	OFF	OFF	D/OFF	OFF
FAN ONLY		OFF	OFF	ON	OFF

16. Power on start

If the connecting wire "POWER ON" (JP8) is cut on the PWB ass'y, when the power is supplied by turning on a circuit breaker, the air conditioner automatically starts of operation in "AUTO".
(Refer to Figure L-2. Printed Wiring Board.)

17. AUTO RESTART

Power failure occurs during operation, the unit will retart in the same operation mode as before after power recovery.
(Refer to Figure L-2. Printed Wiring Board.)

18.Test mode

18-1 TEST 1 (For control circuit operation checking)

Make terminals 1 and 2 of connector CN4 short-circuited and supply the power.
Hereby the timer's period becomes shortened. In this test mode, the control times are shortend as follows.

The operation LED flicker's period

in Test run
The protector timer
The defrost timer
} not shortened

Other controls; 1/60 (ex.; 3 min. to 3 sec.)

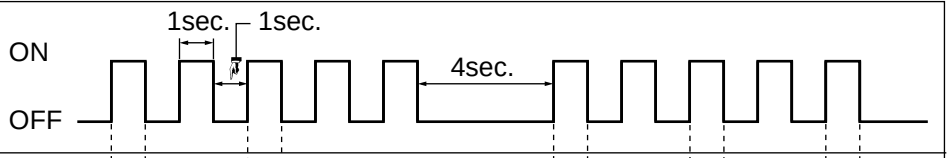
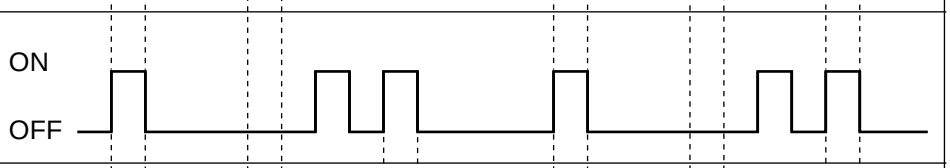
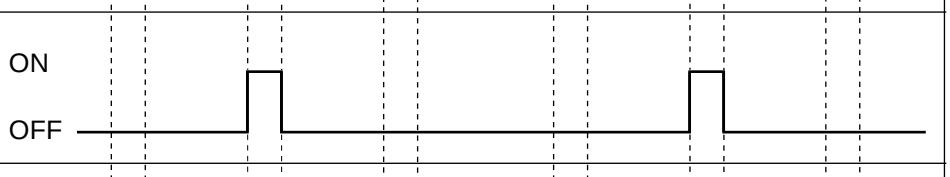
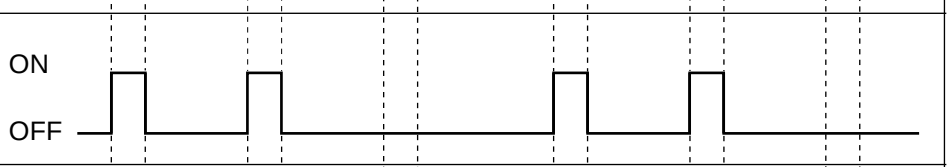
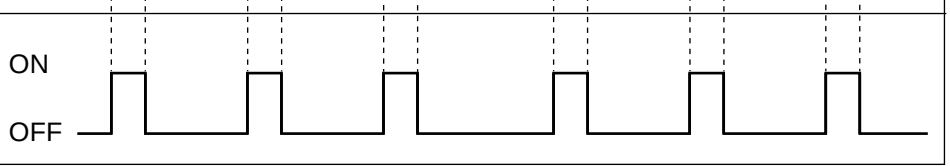
18-2 TEST 2 (For output of each operation checking)

Keep pushing both the buttons, "AUX." and "TEST RUN", and supply the power, the system will go to the test 2 mode. In this mode, the output of operation is switched by pushing the "TEST RUN" button in the unit or the "OI" button in the remote controller. Use the "AUX." button to back to step 1.
Normal outputs are shown in Table Y-6 and Y-7.

19.Diagnosis procedure

When indoor fan motor is out of order or compressor lock occurs, the compressor, inddor fan motor, outdoor fan motor, and louver are all stopped and the operation LED(red) turns on or off syncronously with the timimg of the timer LED.

When the thermistor for room temperature or pipe temperature is open or short state, the operation LED turns on or off syncrnoously with the timing of the timer LED by pushing continously for more than three seconds both "TEST" button and "AUX." button.

	Timer LED	
Indoor fan motor	Operation LED	
Comp.-lock	Operation LED	
Thermistor short state	Operation LED	
Thermistor open state	Operation LED	

Timing chart of Timer LED and Operation LED of DIAGNOSIS PROCEDURE.

When "OI" button the remote controller or "AUX." button in the unit is pushed, the unit is free from DIAGNOSIS PROCEDURE.

Table Y-6 [AY-A079E]

Step	Output for outdoor unit	Lamps		Indoor Fan motor	Louver
		RED	YELLOW		
1	OFF	※1	※2	OFF	OPEN
2	Compressor	Flickering	ON	D	OFF
3	Reverse Valve	ON	OFF	H	OFF
4	Outdoor Fan Motor	ON	ON	L	CLOSE
5	OFF	ON	OFF	D	OFF
6	OFF	OFF	※ 3	UL	OFF
7	OFF	OFF	OFF※ 4	H	OFF
8	OFF	OFF	OFF	M	OFF
9	OFF	OFF	OFF	L	OFF
10	OFF	OFF	ON	OFF	OFF
11	OFF	OFF	OFF	OFF	OFF
12	OFF	ON	OFF	OFF	OFF
13	OFF	OFF	OFF	OFF	OFF
14	OFF	ON	ON	OFF	OFF
15	OFF	ON	ON	OFF	OFF
16	OFF	ON	OFF	OFF	OFF
17	OFF	OFF	OFF	OFF	OFF
18	OFF	OFF	OFF	OFF	OFF
19	OFF	OFF	OFF	OFF	OFF
20	OFF	ON	OFF	OFF	OFF
21	OFF	OFF	ON	OFF	OFF
22	OFF	ON	ON	OFF	OFF
23	OFF	OFF	OFF	OFF	OFF
	(Back to step 1)				

※1 : 7˚C≦ Room temp.< 42˚C ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ ON
: 7˚C > (Room temp.) or (Room temp.) ≧ 42˚C ・・・・・・・・・・・・・・・・・・・・ OFF

※2 : –2˚C≦ Pipe temp. < 42˚C ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ ON
: –2˚C > (Pipe temp.) or (Pipe temp.) ≧ 42˚C ・・・・・・・・・・・・・・・・・・・・・・・・ OFF

※3 : 0.1V≦ (P57 input voltage) ≦ 0.45V ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ ON
: 0.1V > (P57 input voltage) or (P57 input voltage > 0.45V) ・・・・・・・・・・・・ OFF

※4 : When Power on start is effective, Timer LED(yellow) is ON.

Table Y-7[AY-A099E]

Step	Output for outdoor unit	Lamps		Indoor Fan motor	Louver
		RED	YELLOW		
1	OFF	※1	※2	OFF	OPEN
2	Compressor	Flickering	ON	D	OFF
3	Reverse Valve	ON	OFF	H	OFF
4	Outdoor Fan Motor	ON	ON	L	CLOSE
5	OFF	ON	OFF	D	OFF
6	OFF	OFF	※ 3	UL	OFF
7	OFF	OFF	OFF	H	OFF
8	OFF	OFF	OFF	M	OFF
9	OFF	OFF	OFF	L	OFF
10	OFF	OFF	ON	OFF	OFF
11	OFF	OFF	OFF	OFF	OFF
12	OFF	ON	OFF	OFF	OFF
13	OFF	ON	OFF	OFF	OFF
14	OFF	ON	ON	OFF	OFF
15	OFF	ON	OFF	OFF	OFF
16	OFF	ON	OFF	OFF	OFF
17	OFF	OFF	OFF	OFF	OFF
18	OFF	ON	OFF	OFF	OFF
19	OFF	ON	OFF	OFF	OFF
20	OFF	OFF	ON	OFF	OFF
21	OFF	ON	OFF	OFF	OFF
22	OFF	OFF	ON	OFF	OFF
23	OFF	OFF	OFF	OFF	OFF
	(Back to step 1)				

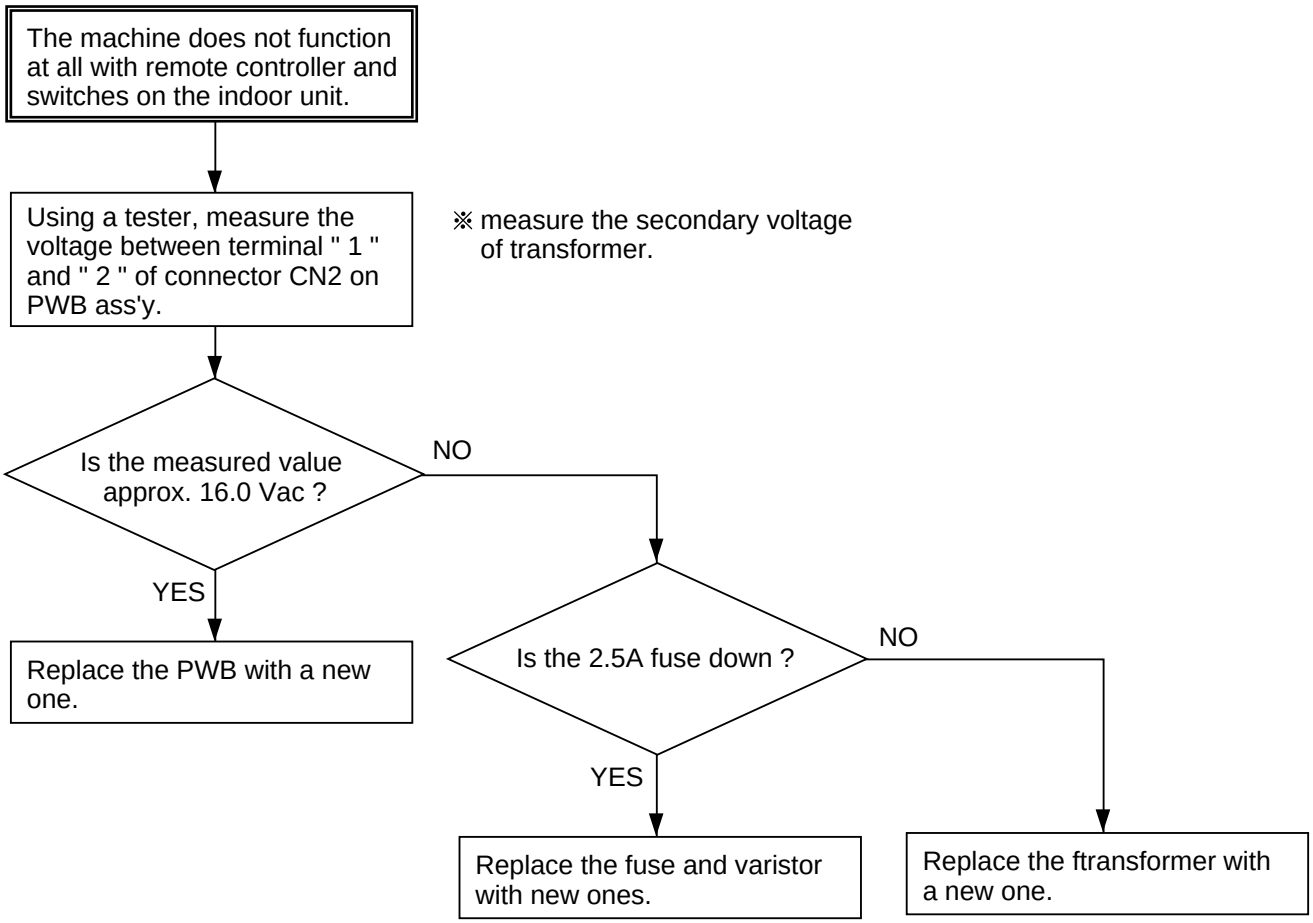
※1 : 7˚C≦ Room temp.< 42˚C ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ ON
: 7˚C > (Room temp.) or (Room temp.) ≧ 42˚C ・・・・・・・・・・・・・・・・・・・・ OFF

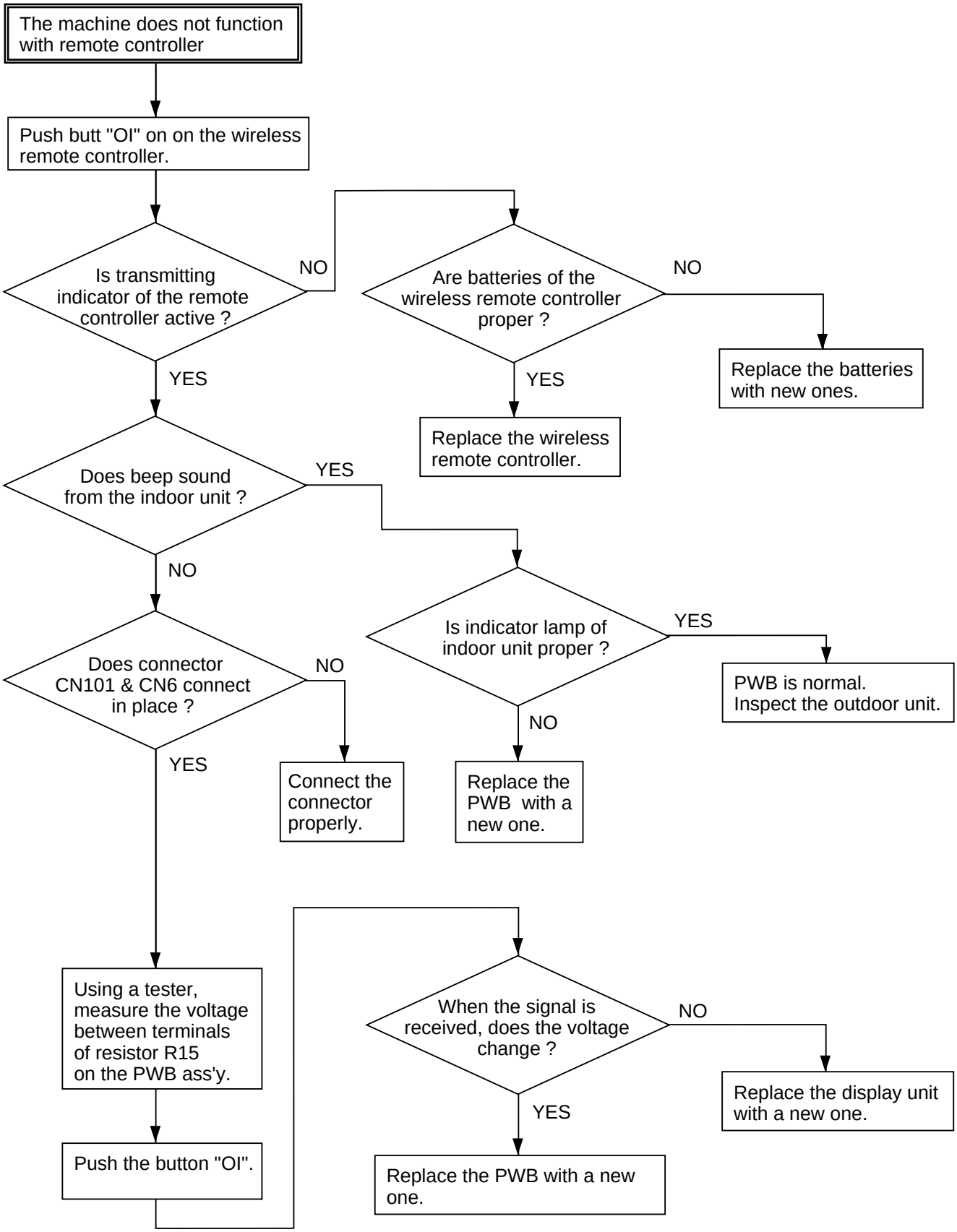
※2 : –2˚C≦ Pipe temp. < 42˚C ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ ON
: –2˚C > (Pipe temp.) or (Pipe temp.) ≧ 42˚C ・・・・・・・・・・・・・・・・・・・・・・・・ OFF

※3 : 0.1V≦ (P57 input voltage) ≦ 0.45V ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ ON
: 0.1V > (P57 input voltage) or (P57 input voltage > 0.45V) ・・・・・・・・・・・・ OFF

※4 : When Power on start is effective, Timer LED(yellow) is ON.

TROUBLESHOOTING GUIDE OF CONTROL CIRCUIT


The machine does not function at all with remote controller and switches on the indoor unit.
Using a tester, measure the voltage between terminal " 1 " and " 2 " of connector CN2 on PWB ass'y.
※ measure the secondary voltage of transformer.
Is the measured value approx. 16.0 Vac ?
NO
YES
Replace the PWB with a new one.
Is the 2.5A fuse down ?
NO
YES
Replace the fuse and varistor with new ones.
Replace the ftransformer with a new one.


The machine does not function with remote controller
Push butt "OI" on on the wireless remote controller.
Is transmitting indicator of the remote controller active ?
NO
YES
Are batteries of the wireless remote controller proper ?
NO
YES
Replace the batteries with new ones.
Replace the wireless remote controller.
Does beep sound from the indoor unit ?
YES
NO
Is indicator lamp of indoor unit proper ?
YES
NO
PWB is normal. Inspect the outdoor unit.
Does connector CN101 & CN6 connect in place ?
NO
YES
Connect the connector properly.
Replace the PWB with a new one.
Using a tester, measure the voltage between terminals of resistor R15 on the PWB ass'y.
Push the button "OI".
When the signal is received, does the voltage change ?
NO
YES
Replace the display unit with a new one.
Replace the PWB with a new one.

CHARACTERISTIC OF TH1 & TH2

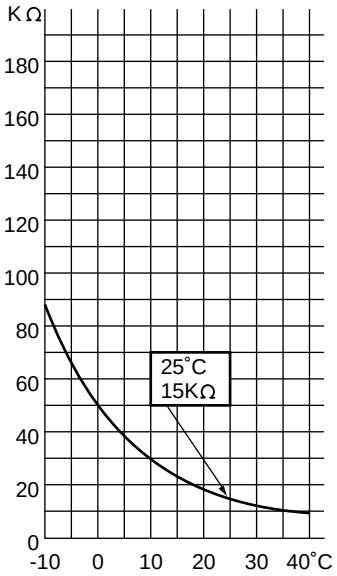


Fig. 1

The room is not cooled at all or not cooled.
The compressor does not operate.

↓

Push the button "TEST RUN" on the indoor unit, and wait 3 minutes.

↓

Using a tester, measure voltage at the terminals on the terminal board.

↓

Is the voltage between terminal "N" and "1" of the terminal board the power supply voltage ?

NO → Replace the PWB ass'y with a new one.

YES ↓

Measure resistances of TH1 and TH2.

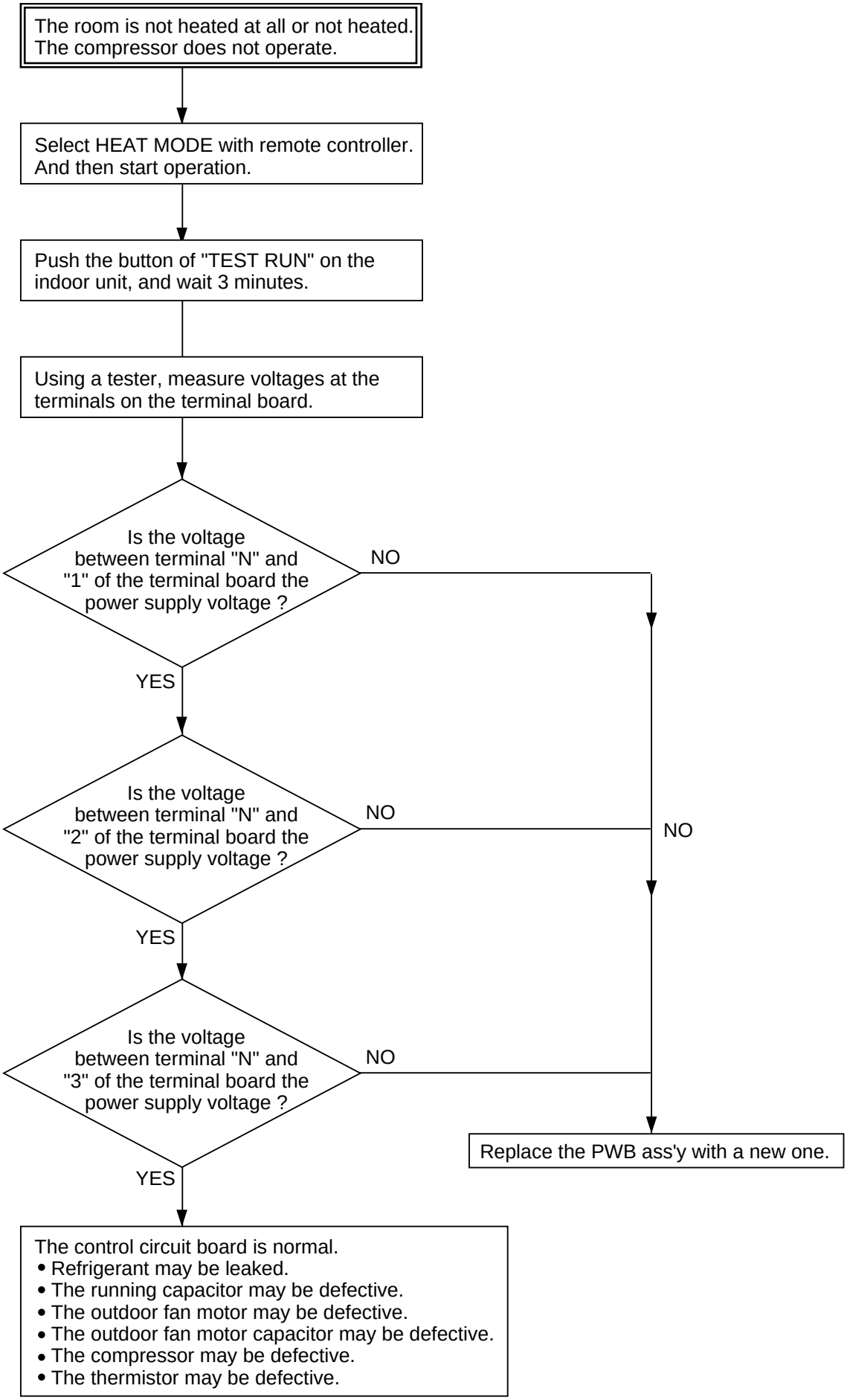
↓

Are the resistances conformed Fig. 1 ?

NO → Replace the thermistor ass'y with a new one.

YES ↓

The control circuit is normal.
- The compressor may be defective.
- The running capacitor may be defective.
- Refrigerant may be leaked.
- The outdoor fan motor may be defective.
- The outdoor fan motor capacitor may be defective.


The room is not heated at all or not heated.
The compressor does not operate.
Select HEAT MODE with remote controller.
And then start operation.
Push the button of "TEST RUN" on the indoor unit, and wait 3 minutes.
Using a tester, measure voltages at the terminals on the terminal board.
Is the voltage between terminal "N" and "1" of the terminal board the power supply voltage ?
NO
YES
Is the voltage between terminal "N" and "2" of the terminal board the power supply voltage ?
NO
NO
YES
Is the voltage between terminal "N" and "3" of the terminal board the power supply voltage ?
NO
YES
Replace the PWB ass'y with a new one.
The control circuit board is normal.
• Refrigerant may be leaked.
• The running capacitor may be defective.
• The outdoor fan motor may be defective.
• The outdoor fan motor capacitor may be defective.
• The compressor may be defective.
• The thermistor may be defective.

REFRIGERATION CYCLE

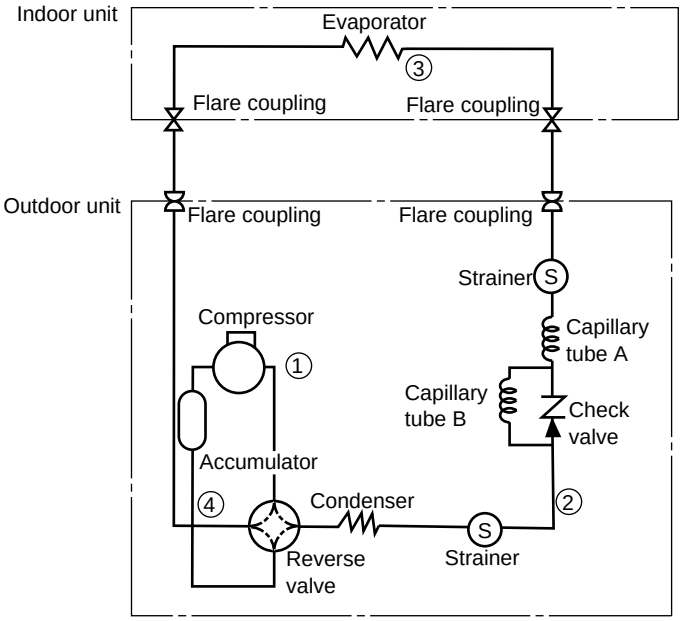
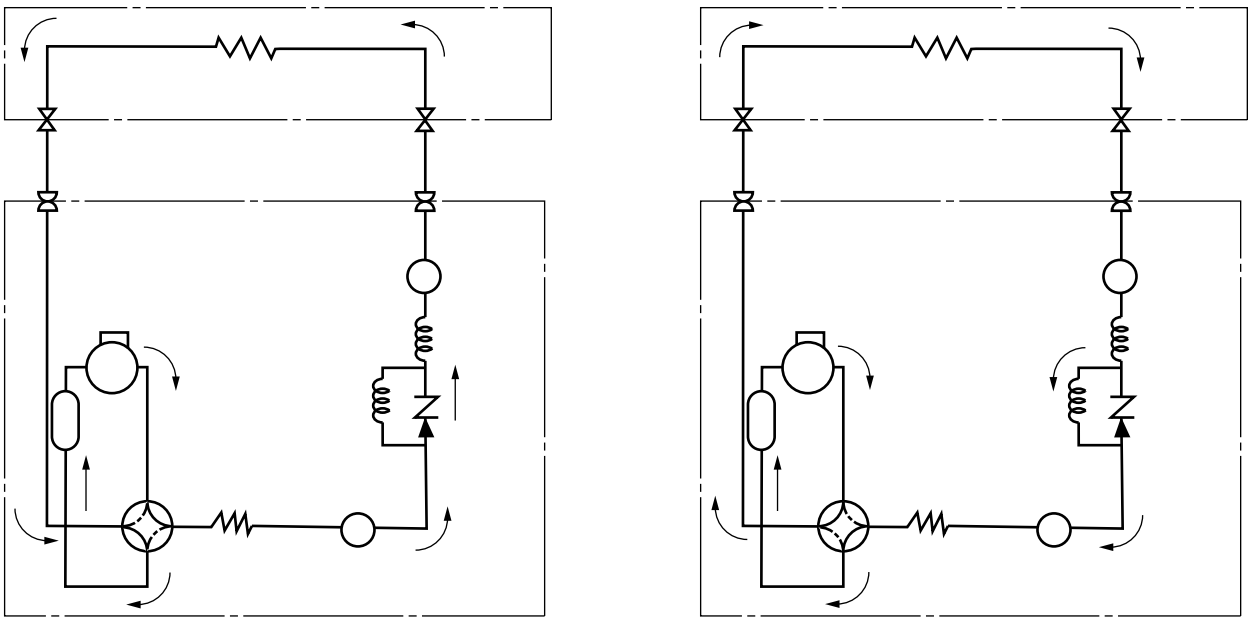


Figure R-1. Refrigeration Cycle for AY-A079E and AY-A099E



At Cooling **At Heating**

Figure R-2. Flow of Refrigerant for AY-A079E and AY-A099E

Cycle temperature and service port pressure

ISO Cooling and Heatpump condition
(at 220V REFRIGERANT PIPE LENGTH 7.5 m)

Model	AY-A079E		AY-A099E	
NO. Condition	Cooling	Heating	Cooling	Heating
①	78˚C	65˚C	80˚C	84˚C
②	43˚C	2˚C	44˚C	1˚C
③	11˚C	33˚C	11˚C	35˚C
④	8˚C	1 ˚C	6˚C	3 ˚C
※ Service port pressure	0.52MPa	1.49MPa	0.47MPa	1.75MPa

※ Gauge pressure

ISO Cooling and Heatpump condition

	Indoor side		Outdoor side	
	Temperature (˚C)	Relative humididity (%)	Temperature (˚C)	Relative humididity (%)
Cooling	27	47	35	40
Heating	20	37	7	87

Dimension of Capillary tube

MODEL	AE-A079E			AE-A099E		
	O.D.	I.D.	L	O.D.	I.D.	L
Capillary tube A	ø 2.7	ø 1.5	800	ø 2.7	ø 1.5	700
Capillary tube B	ø 2.7	ø 1.4	600	ø 2.7	ø 1.5	700

PERFORMANCE CURVES

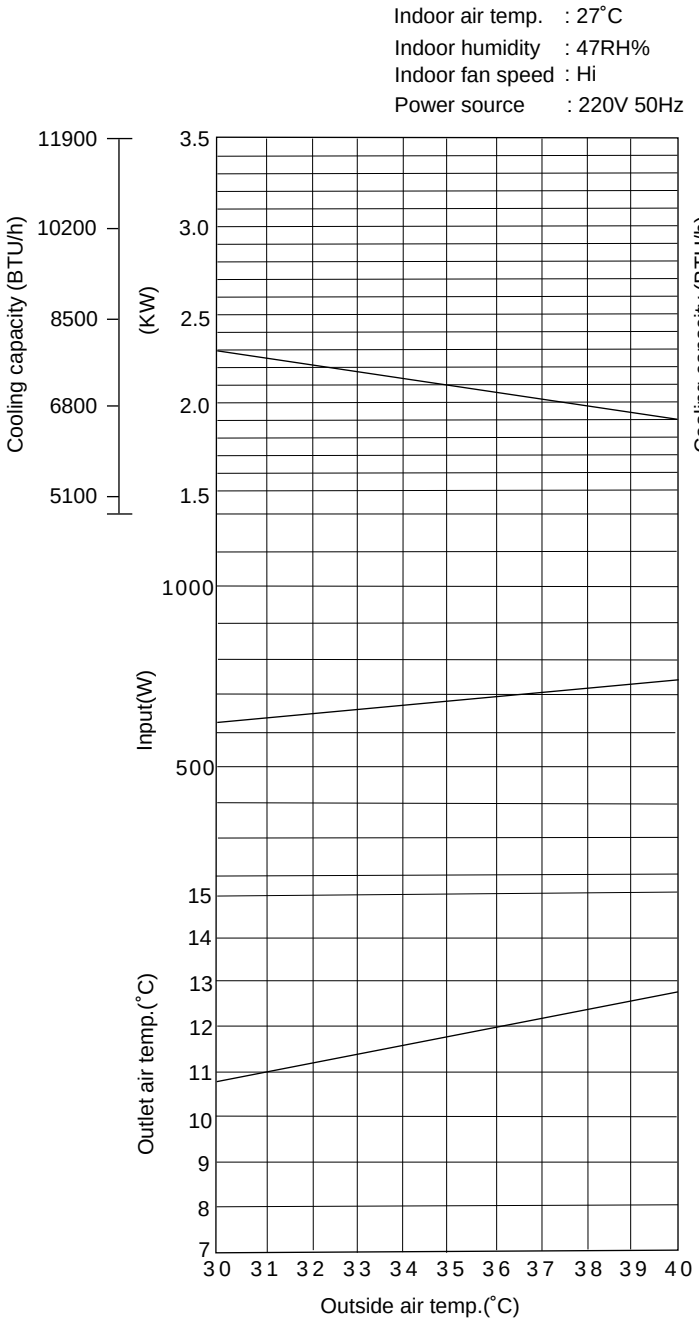


Figure P-1. At Cooling for AY-A079E

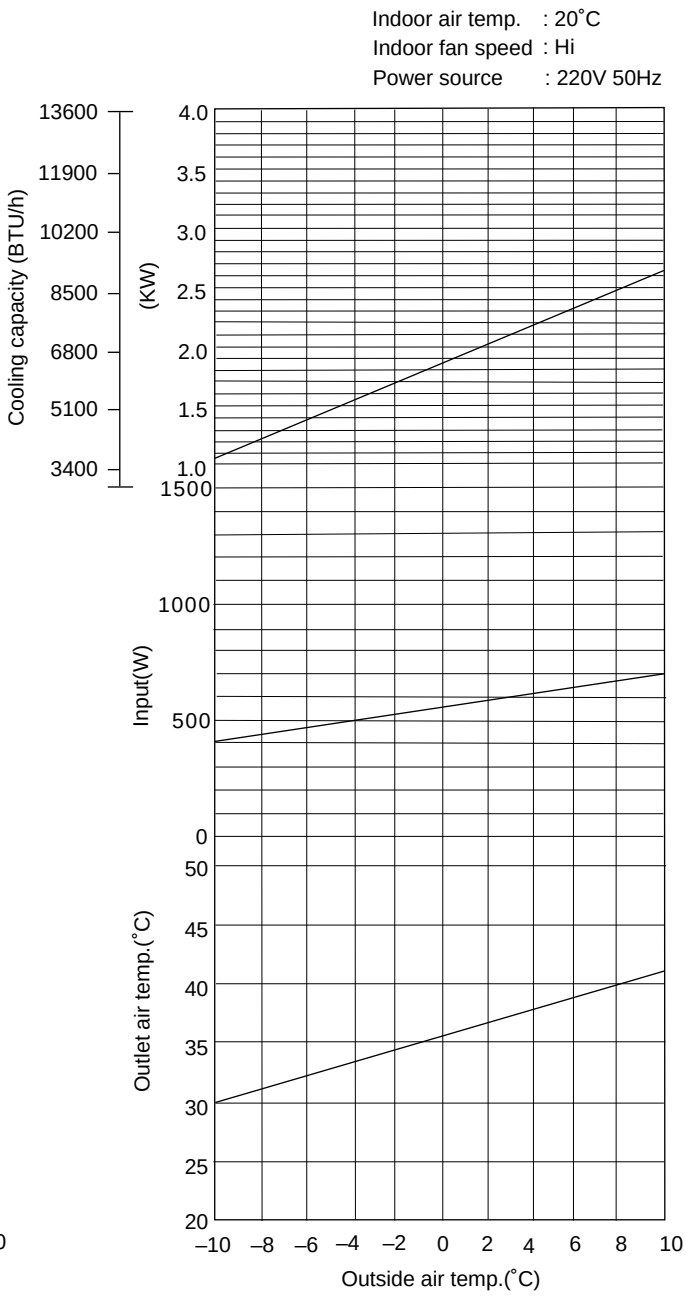


Figure P-2. At Heating for AY-A079E

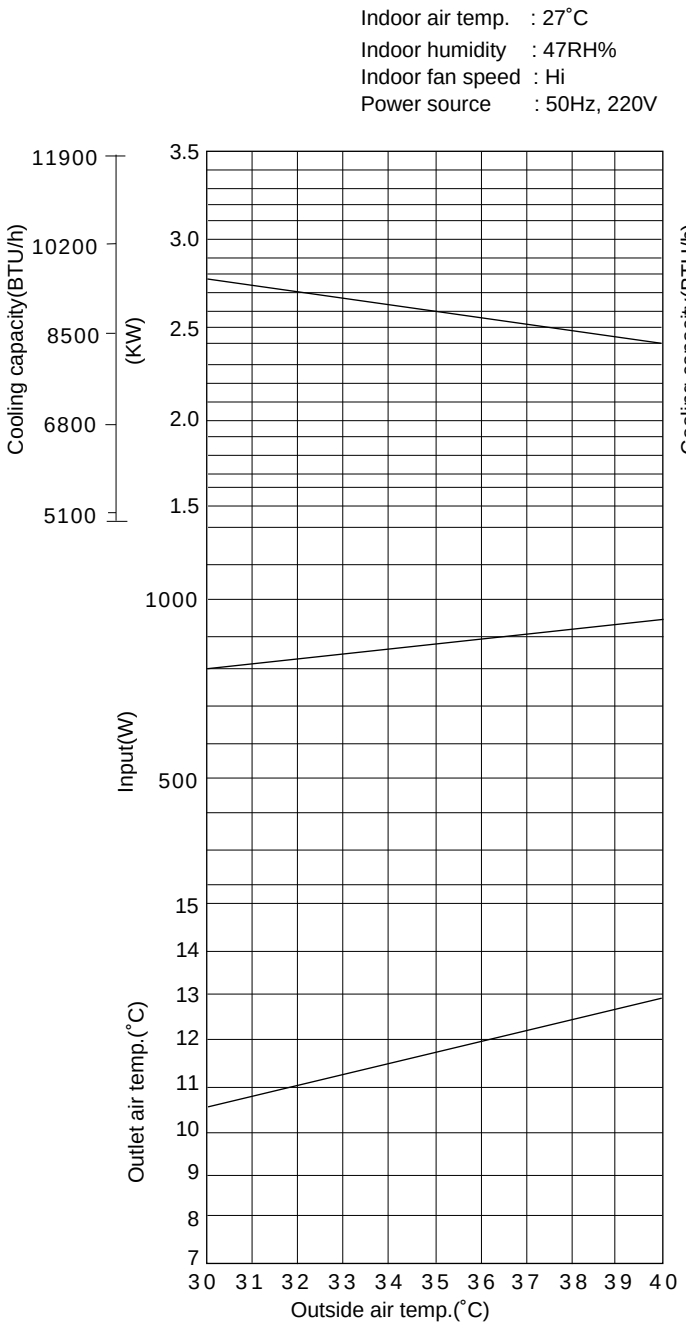


Figure P-3. At Cooling for AY-A099E

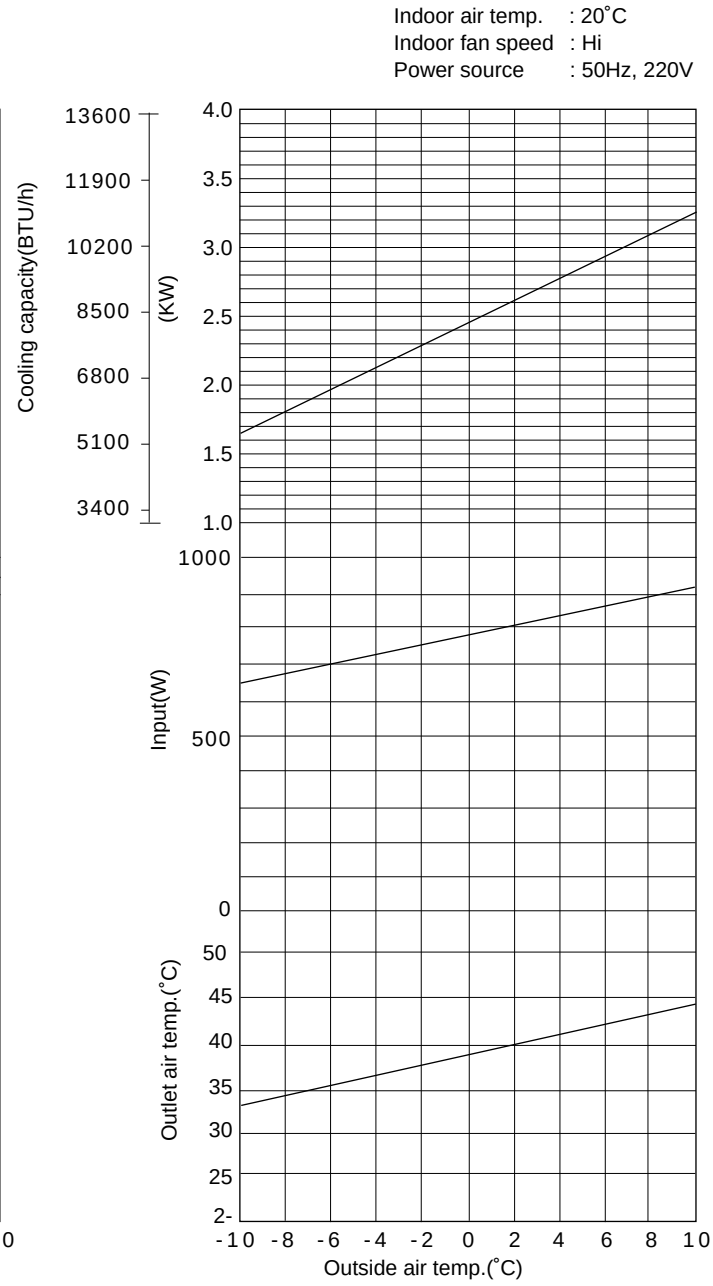


Figure P-4. At Heating for AY-A099E

REFRIGERANT PIPE INSTALLATION WORKS

Refrigerant pipe length and level difference between the indoor and outdoor units.

PIPE SIZE		STANDARD PERMISSIBLE LENGTH	PERMISSIBLE LEVEL DIFFERENCE
GAS	LIQUID		
3/8"	1/4"	10 m	5 m

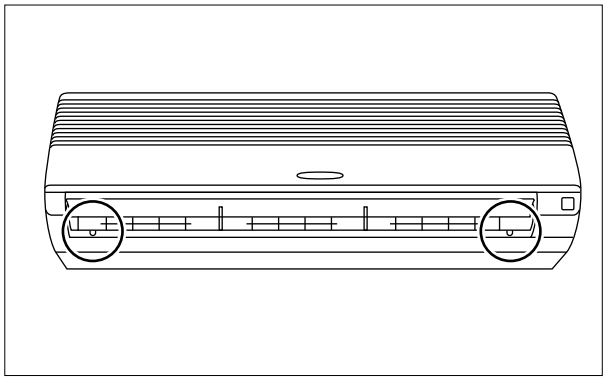
The shorter refrigerant pipe, the highter the machine capabillity. Keep the pipeline as short as possible.

DISASSEMBLING PROCEDURE

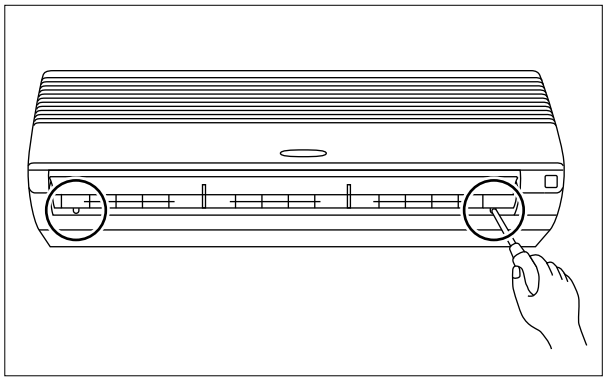
FOR INDOOR UNIT MODEL AY-A079E/AY-A099E

CAUTION: DISCONNECT THE UNIT FROM THE POWER SUPPLY BEFORE ANY SERVICING

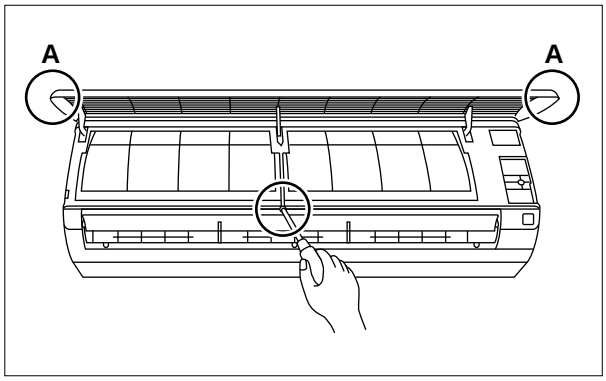
1. Remove the 2 screw covers in the front panel.



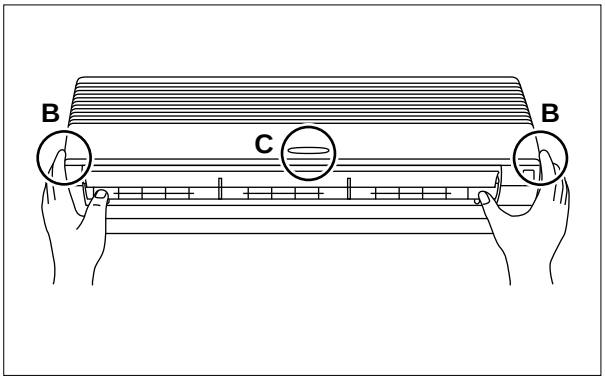
2. Removr 2 fixed screws.



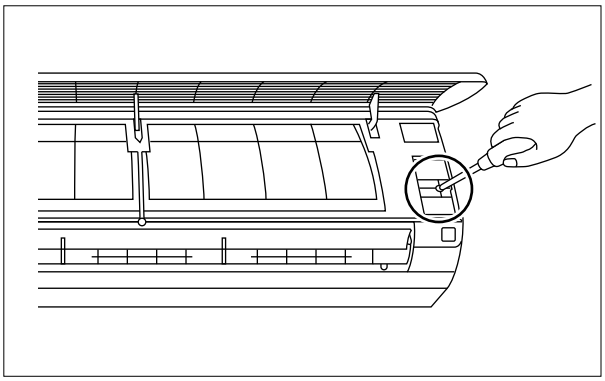
3. Pull the open panel at " A " toward you.
   Remove a fixed screw.



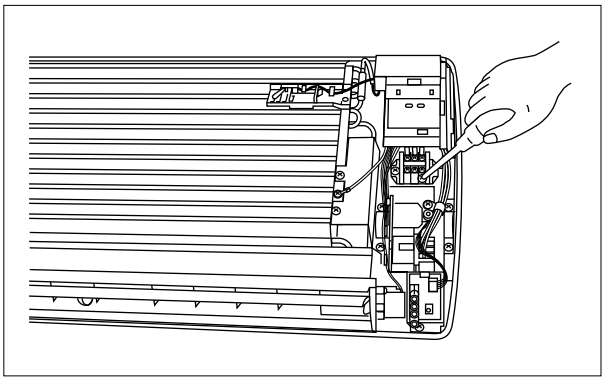
4. Close the open panel softly, and then press " B " and " C " of it securely.
   Remove the front panel ass'y as to lift up.



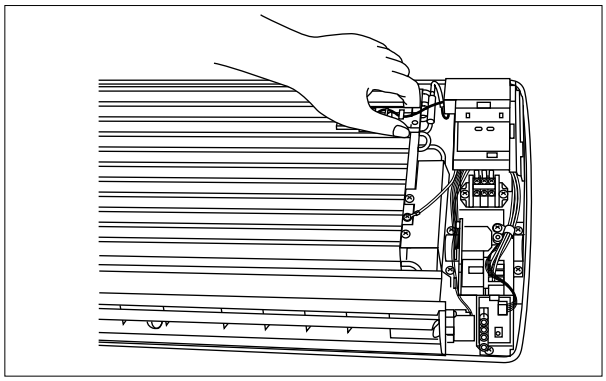
5. Loose a cord clamp screw and take it out.



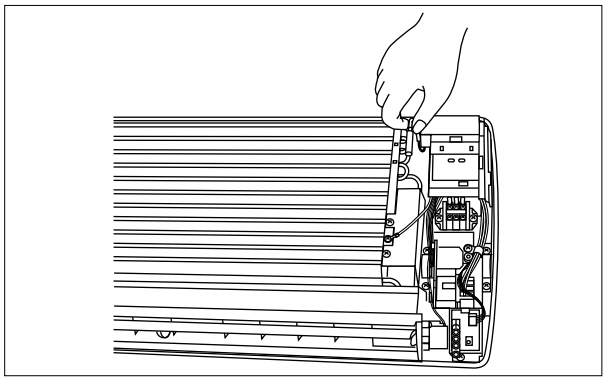
6. Loose 3 screws on the terminal board and take out the unit-to-unit cord from it.



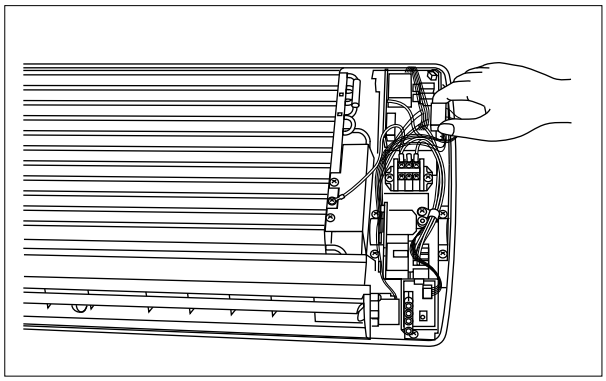
7.Take the thermistor holder from evaporator.



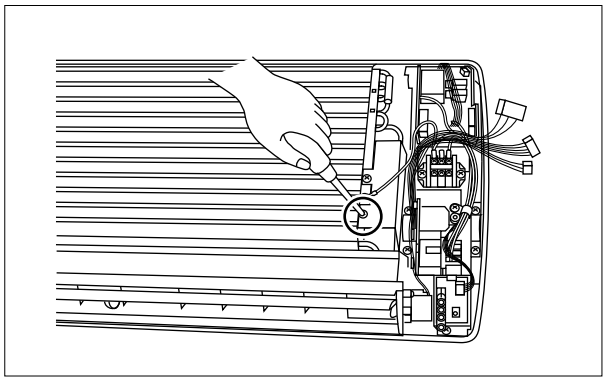
8.Take out the thermistor from evaporator.



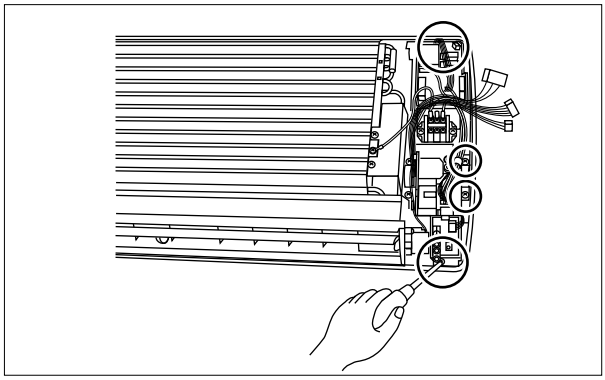
9.Disconnect fan motor connectors and others.



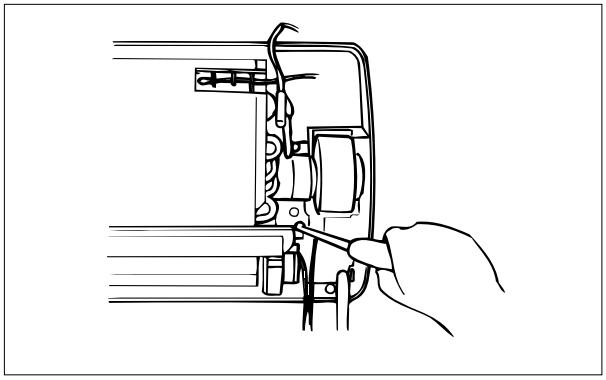
10.Loose 1 screw for a pipe cover and take it out.
Loose the earth screw.



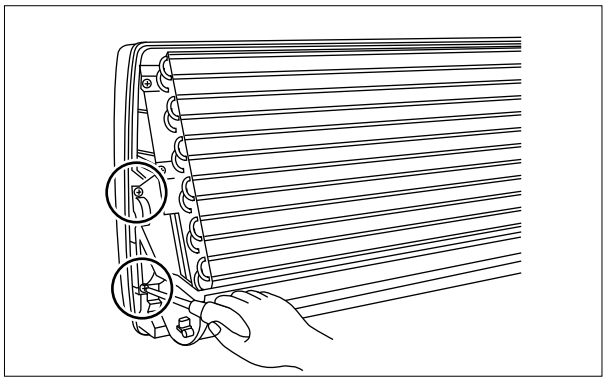
11.Loosen 4 screws fixing control box and take out control ass'y.



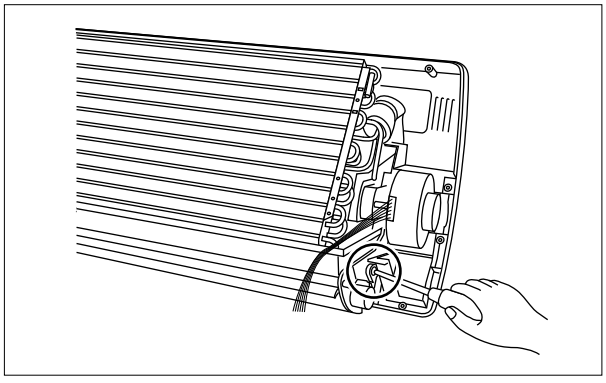
12.Loose a screw fixing drain pan ass'y.(Right side)



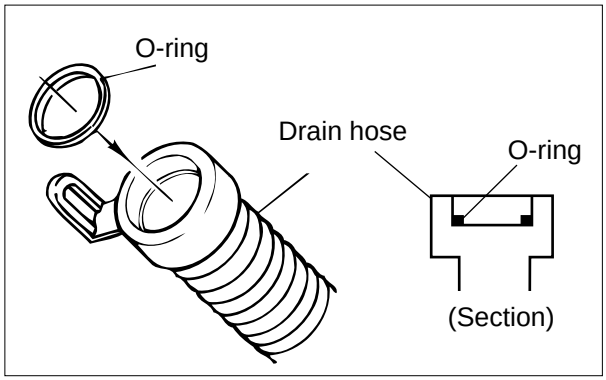
13.Loose 2 screws fixing drain pan ass'y.(Left side)



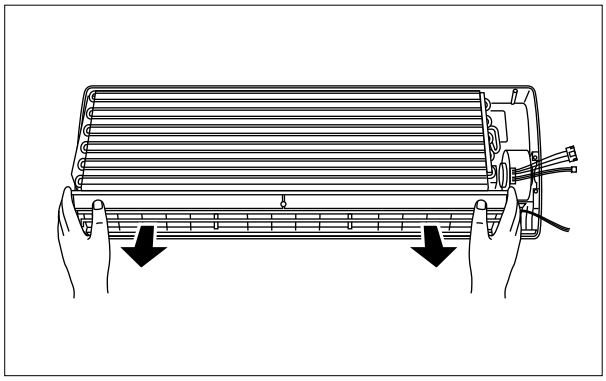
14.Loose a screw fixing drain hose.



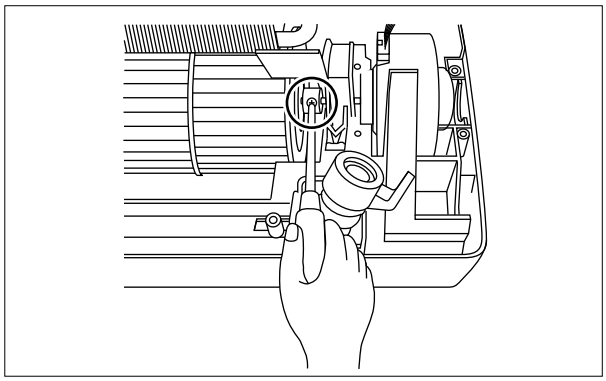
15.When assembling make sure that O-ring is fitted to the drain hose.



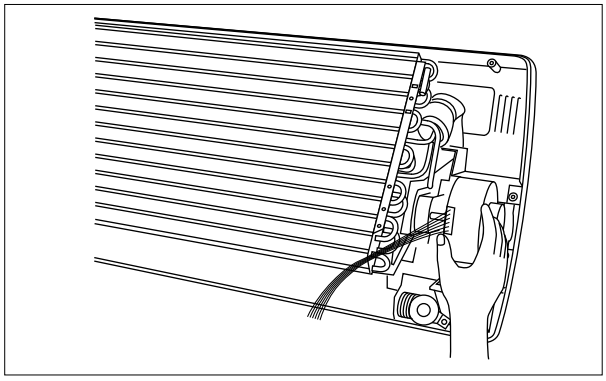
16.Take out the drain pan ass'y.



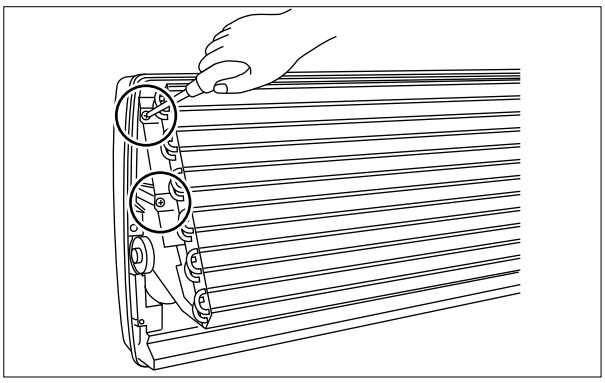
17.Loose a screw fixing cross flow fan to motor.



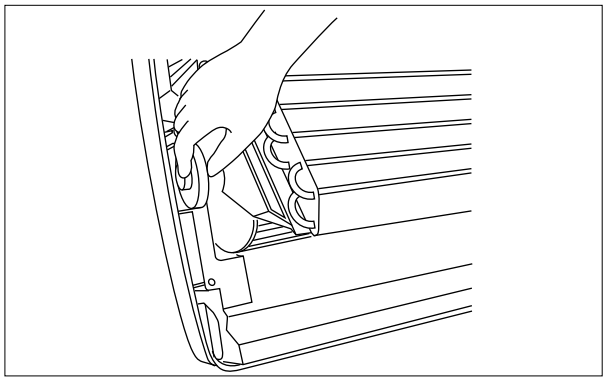
18.Slide the cross fan leftward to depart from the motor shaft and take out fan motor.



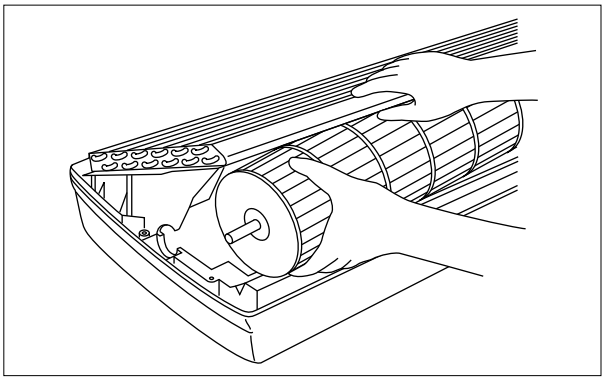
19.Loosen 2 screws fixing evaporator.



20.Take out the fan bearing ass'y.



21.Take out the cross flow fan while slightly lifting the evaporator.



FOR OUTDOOR UNIT MODEL AE-A079E AND AE-A099E

CAUTION: DISCONNECT THE UNIT FROM THE POWER SUPPLY BEFORE ANY SERVICING

① Remove the three (3) screws holding the right side plate and take it out.
② Remove the three (3) screws holding the left side plate and take it out.
③ Remove the another screws holding the cabinet and take it out..

NOTE: Number as shown in following figure is the moval order.

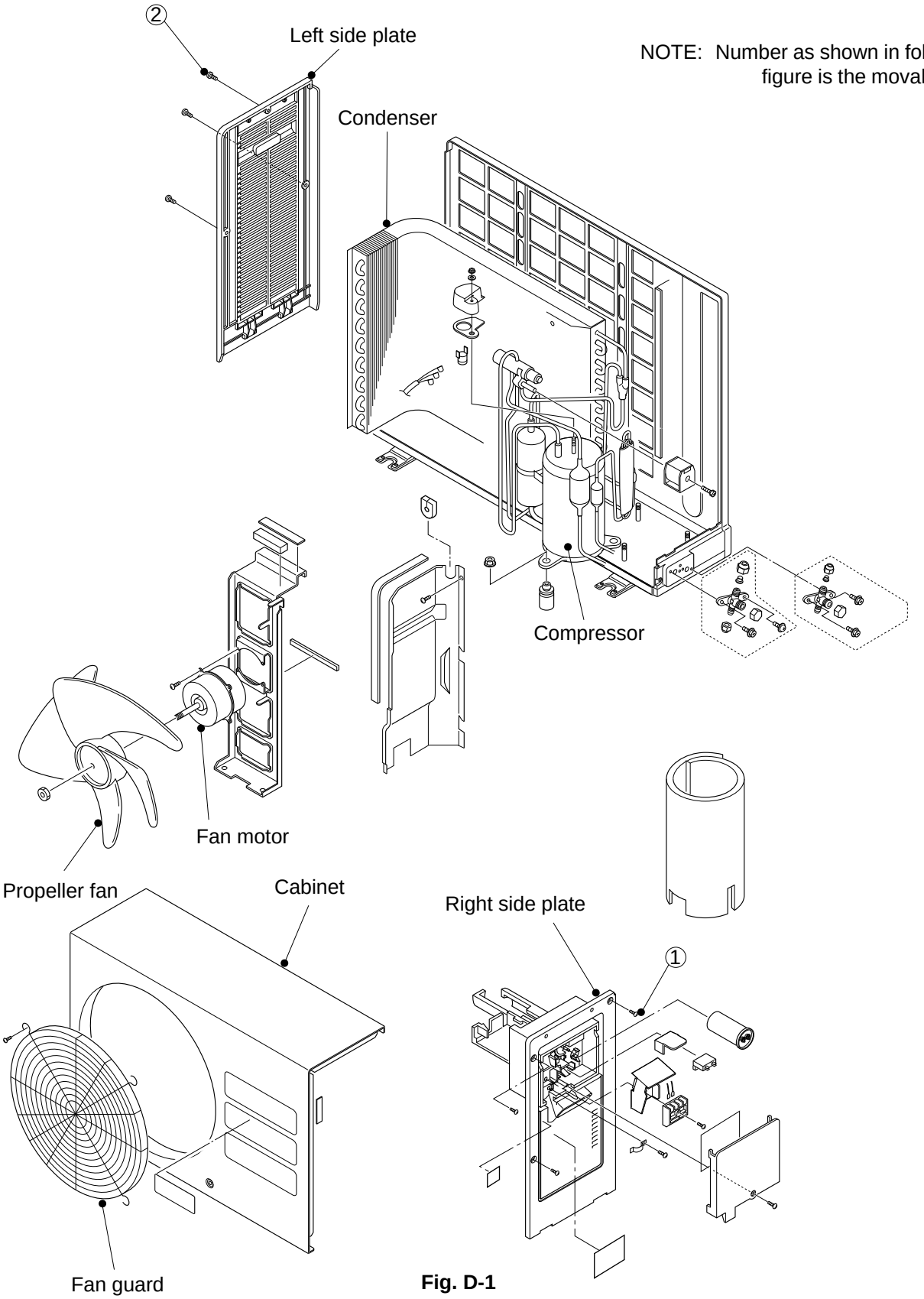


Fig. D-1

REPLACEMENT PARTS LIST [AY-A079E/AY-A099E]

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
		CABINET AND UNIT PARTS		
1- 1	CMOT-A273JBK0	Fan motor sub assembly	1	BN
1- 2	NFANCA042JBE0	Cross flow fan	1	BC
1- 3	CSRA-A444JBK0	Drain pan assembly	1	BK
1- 4	MJNTPA040JBFF	Louver link	3	AC
1- 5	MLOV-A135JBFF	Horizontal adjustment louver A (Vertical louver A)	9	AC
1- 6	MLOV-A136JBFF	Horizontal adjustment louver B (Vertical louver B)	3	AC
1- 7	MLOV-A133JBFE	Vertical adjustment louver A (Horizontal louver A)	1	AK
1- 8	MLOV-A134JBFE	Vertical adjustment louver B (Horizontal louver B)	1	AK
1- 9	PPACGA002JBE0	O ring	1	AA
1-10	RMOT-A050JBE0	Louver motor	1	AY
1-11	PGUMMA071JBE0	Motor cushion	1	AN
1-12	LHLD-A197JBFP	Louver holder	4	AC
1-13	PGUMMA086JBE0	Motor cushion	1	AG
1-14	PCOV-A190JBE0	Drain cover	1	AE
1-15	CHLD-A053JBK0	Bearing assembly	1	AD
1-16	LHLD-A187JBFA	Tube holder	1	AD
1-17	PSHE-A099JBE0	Evaporator sheet	1	AH
1-18	LSPR-A006JBE0	Sheet spring for fixing evaporator seat	2	AB
1-19	DCHS-A255JBK0	Cabinet assembly	1	AZ
1-20	DWAK-A779JBK0	Panel assembly	1	AX
1-21	PFILMA077JBEB	Air filter	2	AN
1-22	HDEC-B020JBEA	Display cover	1	AL
1-23	HBDG-A059JBEA	Badge	1	AF
1-24	LHLD-A209JBFA	Front panel hinge R	1	AF
1-25	MARMPA012JBFA	Open panel hinge L	1	AD
1-26	MARMPA013JBFA	Open panel hinge R	1	AD
1-27	LHLD-A208JBFA	Front panel hinge L	1	AD
1-28	PBOX-A120JBK0	Louver gear assembly	1	AZ
1-29	NBRG-A026JBFA	Louver bushing	2	AB
1-30	PSHE-A098JBE0	Evaporator seal	1	AC
1-31	TLABPA175JBR0	Louver seal	1	AB
1-32	TSPC-C981JBRA	Name label [AY-A079E]	1	AD
1-32	TSPC-C955JBRA	Name label [AY-A099E]	1	AD
1-33	PGUMSA046JBE0	Damper rubber	1	AD
1-34	CPNL-A084JBK0	Open panel assembly	1	AV
1-35	PFPFPB074JBE0	Thermistor insulation	1	AB
1-36	PHOS-A015JBE0	Drain hose	1	AL
1-37	LHLD-A204JBF0	Motor holder	1	AE
1-38	PSEL-B417JBE0	Aluminum tape	1	AC
1-39	PSEL-B418JBE0	Aluminum tape	1	AD
1-40	PSEL-B494JBE0	Aluminum tape	1	AD
1-41	PSEL-B492JBE0	Aluminum tape	1	AC
		CONTROL BOX PARTS		
2- 1	FSGY-A141JBK0	Display board unit	1	AS
2- 2	FPWBFA013JBK0	Switch board unit	1	AM
2- 3	QTAN-A087JBE0	Terminal board (5P)	1	AS
2- 4	QTAN-A088JBE0	Terminal board (3P)	1	AP
2- 5	DPWBFA151JBK0	Control board unit [AY-A079E]	1	BQ
2- 5	DPWBFA149JBK0	Control board unit [AY-A099E]	1	BR
2- 6	QFS-AA050JBE0	Fuse 250V 2.5A	1	AD
2- 7	QACC-A194JBE0	Power supply cord	1	AU
2- 8	RTRN-A182JBE0	Transformer	1	AY
2- 9	RC-HZA195JBE0	Fan motor capacitor	1	AL
2-10	RTHM-A296JBE0	Thermistor	1	AN
2-11	LHLD-A190JBF0	Thermistor holder	1	AG
2-12	PBOX-A149JBF0	Control box	1	AN
2-13	HPNLCA497JBF0	Control box cover	1	AF
2-14	HPNLCA616JBE0	Control panel	1	AE
2-15	LHLD-A266JBF0	Cord holder	1	AE
2-16	LHLD-A265JBF0	Cord clamp	1	AC
2-17	TLABCB254JBR0	Wiring diagram	1	AC
2-18	PSHE-A076JBE0	Protection cover	1	AE
2-19	PGUMMA095JBE0	Wire cushion	1	AA
2-20	PCOV-A191JBE0	LED holder	1	AD
2-21	RH-IXA519JBE0	Microcomputer (IC1)	1	AX
2-22	RH-IZA149JBE0	Integrated circuit (IC2)	1	AE
2-23	RIC--A022BDE0	Integrated circuit (IC3)	1	AE
2-24	RIC--A025BDE0	Integrated circuit (IC4)	1	AE
2-25	RH-IZA140JBE0	Integrated circuit (IC5)	1	AE
2-26	RH-IZA337DRE0	EEPROM(IC6)	1	AK
2-27	VHRS201D01/-6	Solid state relay(SSR)	1	AK
2-28	RRLYJA067JBE0	Relay (RY)	1	AP
2-29	RFIL-A042JBE0	Coil (L)	1	AM

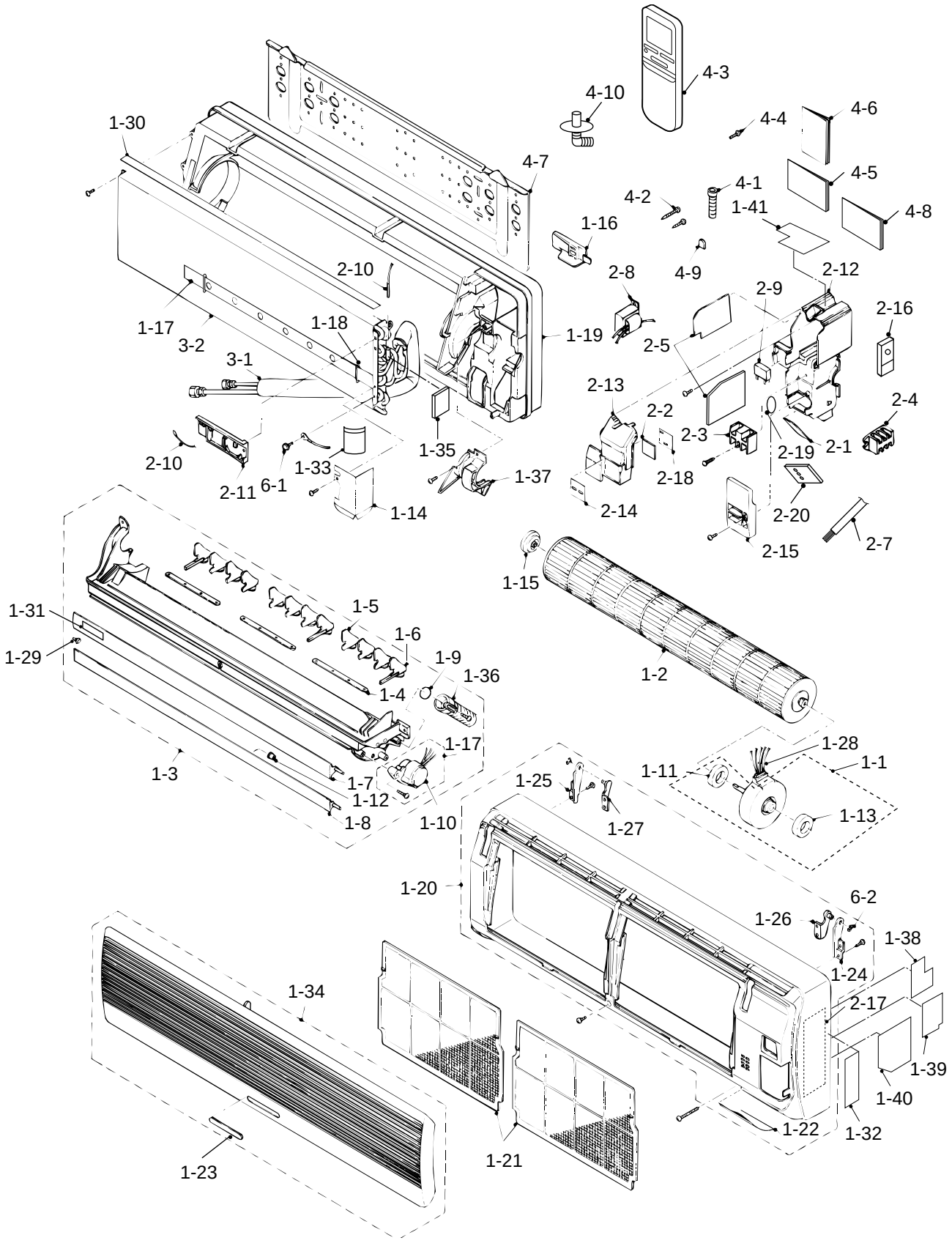
REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
2-30	RH-VZA025JBE0	Varistor (NR)	1	AD
2-31	RC-QZA096JBE0	Capacitor (C1)	1	AE
2-32	RTRN-A181JBE0	Current transformer(CT)	1	AN
2-33	RH-VZA020JBE0	Varistor (CNR1, CNR2)	2	AE
2-34	RRLYJA059JBE0	Relay (RY2, RY3)	2	AN
		CYCLE PARTS		
3- 1	CPIPCA612JBK0	Pipe assembly	1	AZ
3- 2	PEVA-A244JBE0	Evaporator	1	BS
		ACCESSORY PARTS		
4- 1	LX-NZ0247JBE0	Wall plug, fixing Mounting plate	7	AB
4- 2	XTTSD45P30000	Screw for Wall plug	6	AA
4- 3	CRMC-A489JBE0	Wireless remote controller	1	BG
4- 4	LX-BZA106JBE0	Special screw	1	AD
4- 5	TINS-A563JBR0	Installation manual	1	AD
4- 6	TINSEA220JBR0	Operation manual	1	AP
4- 7	PPLTNA022JBP0	Mounting plate	1	AL
4- 8	TINS-A564JBR0	Installation manual	1	AD
4- 9	FCOV-A013JBFS	Screw cover	2	AC
4-10	LPFT-A022JBF0	Drain joint	1	AD
		SCREWS AND RING		
6- 1	LX-BZA075JBE0	Special screw	1	AA
6- 2	XREUW50-06000	Ring	2	AA

HOW TO ORDER REPLACEMENT PARTS

To have your order filled prompty and correctly, please furnish the following information.

1. MODEL NUMBER 2. REF. NO.
3. PART NO. 4. DESCRIPTION

INDOOR UNIT FOR AY-A079E AND AY-A099E



REPLACEMENT PARTS LIST [AE-A079E/AE-A099E]

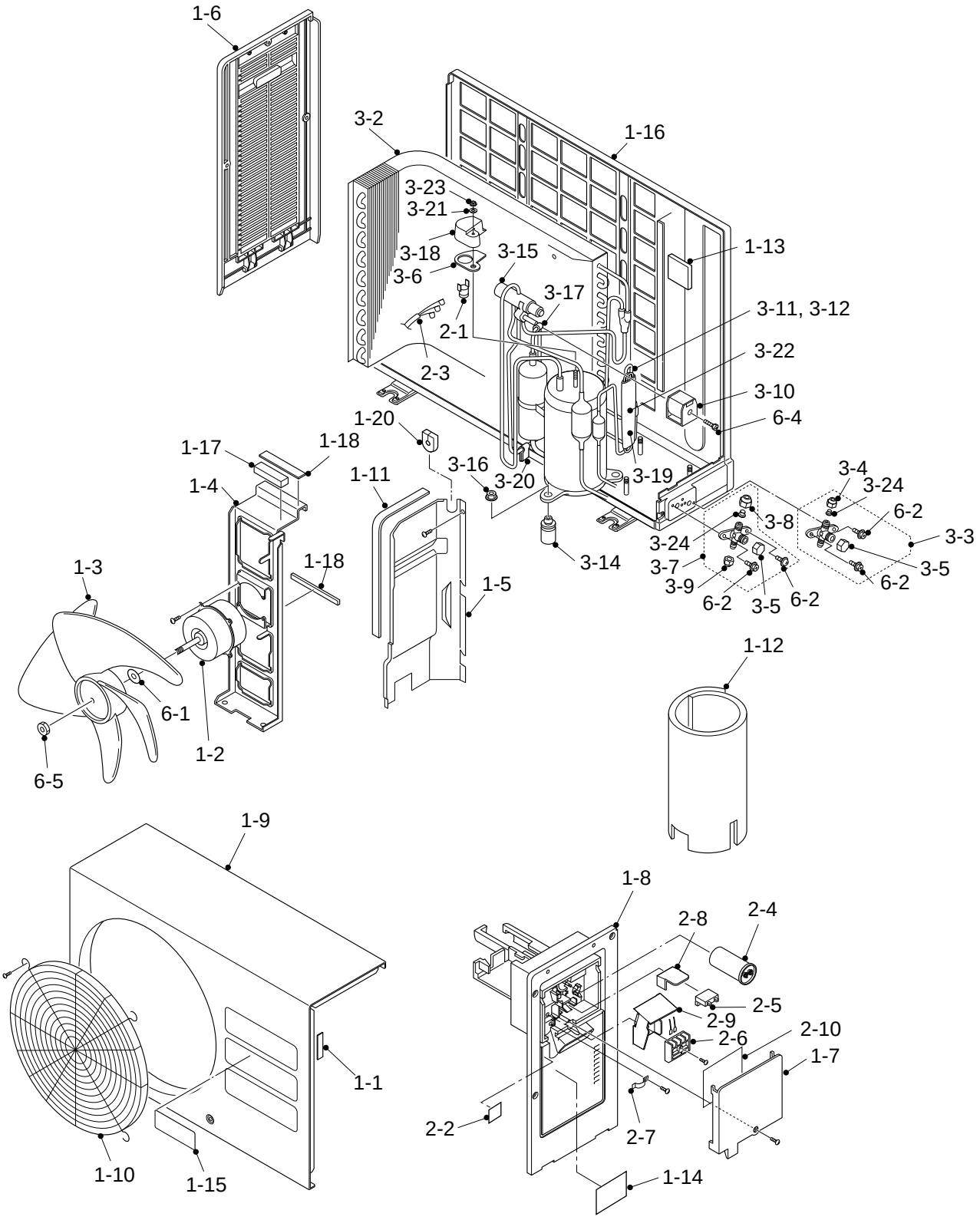
REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
		CABINET AND UNIT PARTS		
1- 1	PSEL-A345JBE0	Cabinet seal	1	AK
1- 2	CMOTLA592JBE0	Fan motor	1	BP
1- 3	NFANPA020JBEA	Propeller fan	1	AW
1- 4	PANGKA018JBP0	Fan motor angle	1	AP
1- 5	PSKR-0106JBP0	Bulkhead	1	AM
1- 6	GPLTPA014JBFA	Left side cover	1	AR
1- 7	GFTA-A387JBF0	Terminal cover	1	AH
1- 8	GBOX-A004JBFA	Right side cover	1	AS
1- 9	GCAB-A105JBTA	Cabinet	1	BA
1-10	GGADFA030JBEA	Fan guard	1	AY
1-11	PSEL-A346JBE0	Bulkhead seal	1	AK
1-12	PSPF-A430JBE0	Compressor cover [AE-A079E]	1	AV
1-12	PSPF-A692JBE0	Compressor cover [AE-A099E]	1	AY
1-13	PGUMSA202JBE0	Damper rubber [AE-A079E only]	1	AE
1-14	TSPC-C958JBR0	Name label [AE-A079E]	1	AD
1-14	TSPC-C957JBR0	Name label [AE-A099E]	1	AE
1-15	TLABBA029JBRA	SHARP badge	1	AD
1-16	CCHS-A464JBTA	Base pan assembly [AE-A079E]	1	BF
1-16	CCHS-A636JBTA	Base pan assembly [AE-A099E]	1	BF
1-17	PSPF-A277JBE0	Angle seal	1	AK
1-18	PSEL-A347JBE0	Angle seal	2	AK
1-19	PSEL-A344JBE0	Condenser seal	1	AK
1-20	LBSHCA022JBF0	Bushing	1	AE
		CONTROL BOX PARTS		
2- 1	RHOG-A107JBE0	Protector [AE-A079E]	1	AX
2- 2	TLABPA182JBE0	Badge	1	AC
2- 3	CW-VZA208JBK0	C wire sub assembly [AE-A079E]	1	AR
2- 3	QW-VZD438JBE0	C wire sub assembly [AE-A099E]	1	AQ
2- 4	RC-HZA316JBE0	Running capacitor	1	AY
2- 5	RC-HZA071JBE0	Fan motor capacitor	1	AH
2- 6	QTAN-A145JBE0	Terminal board	1	AQ
2- 7	LHLD-0261JBM0	Cord holder	1	AB
2- 8	PCOV-A455JBP0	Capacitor cover	1	AF
2- 9	PCOV-A471JBP0	Terminal cover	1	AR
2-10	TLABCA662JBR0	Wiring diagram [AE-A079E]	1	AB
2-10	TLABCB152JBR0	Wiring diagram [AE-A099E]	1	AC
		CYCLE PARTS		
3- 1	PCMPRA177JBE0	Compressor [AE-A079E]	1	CM
3- 1	PCMPRA289JBE0	Compressor [AE-A099E]	1	CG
3- 2	PCON-A263JBP0	Condenser [AE-A079E]	1	BY
3- 2	PCON-A407JBP0	Condenser [AE-A099E]	1	BY
3- 3	DVLV-A189JBK0	2 Way valve assembly	1	BA
3- 4	PSEN-A004JBK0	Flare nut assembly 1/4"	1	AE
3- 5	LX-NZA033JBE0	Valve cap	2	AF
3- 6	PSEL-A006JBE0	Terminal gasket [AE-A079E]	1	AC
3- 6	PSEL-B172JBE0	Terminal gasket [AE-A099E]	1	AD
3- 7	DVLV-A212JBK0	3 way valve unit	1	BB
3- 8	PSEN-A005JBK0	Flare nut assembly 3/8"	1	AG
3- 9	LX-NZA034JBE0	Service cap	1	AD
3-10	CCIL-A064JBK0	Reverse valve coil assembly	1	AW
3-11	PCPY-A281JBE0	Capillary tube [AE-A079E]	1	AP
3-11	PCPY-A665JB10	Capillary tube [AE-A099E]	1	AH
3-12	PCPY-A282JBE0	Capillary tube [AE-A079E]	1	AN
3-12	PCPY-A666JB10	Capillary tube [AE-A099E]	1	AG
3-13	PSRN-A040JBE0	Strainer	1	AN
3-14	GLEG-A073JBE0	Compressor cushion [AE-A079E]	3	AD
3-15	PVLVXA009JBE0	Reverse valve	1	BE
3-16	LX-NZA028JBE0	Special nut	3	AB
3-17	PGUMS0147JBE0	Damper rubber	1	AE
3-18	PCOV-A002JBE0	Terminal cover [AE-A079E]	1	AE
3-18	PCOV-A378JBE0	Terminal cover [AE-A099E]	1	AH
3-19	PVLVC0353JBE0	Check valve [AE-A079E]	1	AK
3-19	PPIPCB449JBE0	Check valve [AE-A099E]	1	AM
3-20	PGUMSA033JBE0	Damper rubber [AE-A099E]	1	AH
3-21	PSEL-B722JBE0	Rubber washer [AE-A099E]	1	AE
3-22	PGUMS0227JBE0	Damper rubber [AE-A079E]	1	AF
3-22	PGUMSA234JBE0	Damper rubber [AE-A099E]	1	AK
3-23	LX-NZA002JBE0	Special nut [AE-A079E]	1	AA
3-23	LX-NZA051JBE0	Special nut [AE-A099E]	1	AH
3-24	LX-NZA081JBE0	Bonnet	2	AG

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
		SCREWS, NUT AND WASHER		
6- 1	LX-WZA019JBE0	Special washer	1	AB
6- 2	LX-BZA078JBE0	Special screw	3	AB
6- 3	LX-BZA075JBE0	Special screw	1	AA
6- 4	LX-BZA127JBE0	Special screw	1	AC
6- 5	LX-NZA030JBE0	Special nut	1	AB
6- 6	LX-CZA038JBE0	Special screw	2	AB
6- 7	LX-BZA076JBE0	Special screw	4	AA
6- 8	XTTUW40P16000	Tapping screw	2	AB

HOW TO ORDER REPLACEMENT PARTS

1. MODEL NUMBER 2. REF. NO.
3. PART NO. 4. DESCRIPTION

OUTDOOR UNIT FOR AE-A079E AND AE-A099E



SHARP

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